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THE

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REGULAR CONTRIBUTIONS

A CONSIDERATION OF THE SHRINKAGE OF THE INVESTMENT—INVESTING THE WAX MODEL SO AS TO PROCURE THE MINIMUM POSSIBILITY OF DISTORTION

By C. J. Clark, D. D. S., Chicago, Ill.

THE instability of the investment used for the purpose of forming the mould into which the molten metal is forced, has been considered the prime factor in contributing to the cause of many failures in the process of casting gold under pressure. It being charged—

1st. That the investment being porous, allows the pressure to envelop the molten metal in the mould, causing distortion and augmenting the shrinkage of the metal.

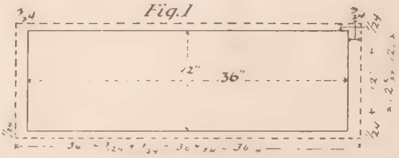
2nd. That the investment is not of sufficient integrity to withstand the contact of the molten metal when considerable pressure is used to force the molten metal into the mould.

3rd. That the investment shrinks, thereby causing a distortion of the mould.

THE POROSITY OF THE INVESTMENT

The porosity of the investment can be considered as a detrimental factor only in cases where the force used to drive the metal into the mould is an expanding gas and in an extensive piece of work, the pressure not being restricted to exert its force on the metal in the crucible, but being free to penetrate the investment by virtue of its porosity, and to envelop and attack the metal on all surfaces, thereby causing compression from several directions, and must exert a deleterious influence on the finished product.

Fig.1



Before a cast is made the mould contains air, and when the metal is forced into the mould, it must displace the confined air and expel it into the porous investment, where it meets, and offers opposition to and impedes the free expulsion of air from the mould, thereby retarding the ingress of the metal into the mould.

THE INTEGRITY OF THE INVESTMENT

When we consider the extreme fluidity of the molten metal, if judgement is exercised, there is no danger from this source; for the molten metal is in such a state as to be incapable of making any impression on the walls, angles and convolutions of the mould as it might if in a more coherent condition. The direct opposite is true, the walls, angles, and convolutions of the mould, imprint their every reflection on the surface of the molten metal, and unless an excessive force be used, there is no danger of distorting the mould from the intact of the molten metal.

Fig.2

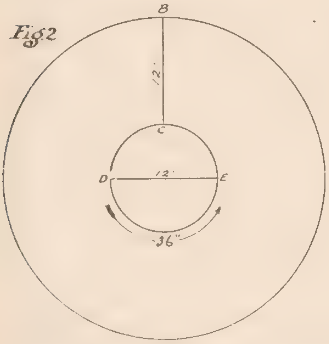
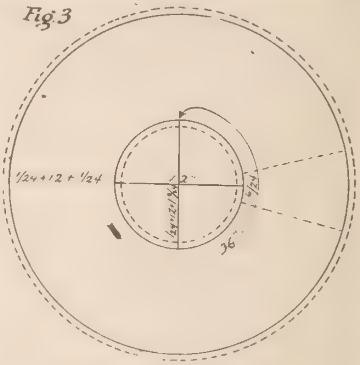


Fig.3



FOOT NOTE—By special arrangement this article is published simultaneously in THE DENTAL SUMMARY and *The Bur*.

THE SHRINKAGE OF THE INVESTMENT

Let us suppose Fig. 1 to represent a bar of iron 36 in. in length and 12 in. in width, and of equal density throughout the mass. Under a definite degree of heat it will expand to the extent of 3-24 of an inch, in each direction from its mean line of linear expansion and 1-24 inch in each direction from its mean line of lateral expansion. The dimensions of the bar would then be 36 + 3-24 + 3-24 = 36 6-24 + 12 + 1-24 + 1-24 = 12 2-24 or 36 6-24 + 12 2-24 as represented by Fig. 1. Now let us suppose that the same bar is bent into the form of a ring the inner circumference of which would measure 36 in. with a consequent diameter of approximately 12 in. (The diameter of a circle being determined by dividing the circumference by three and a fraction, the fraction being omitted to simplify.) The dimension of the outer circumference is immaterial. Now if the same definite degree of heat be applied as was to the straight bar, we will discover that while the dimension of the outer circumference has increased, the dimension of the inner circumference remains unchanged. For the simultaneous increase of the outer and inner dimension of the respective circumferences, without taking into consideration the lateral expansion of the ring, would form a ring the inner circumference of which would measure 36 6-24 with a resultant diameter of 12 2-24 (Fig. 3). But the lateral dimensions of the ring are increased by expansion to the extent of 1-24 inch in each direction from the mean line of lateral expansion, (see Fig. 3 and note dotted lines,) thereby increasing the lateral dimension of the ring toward the center of the inner circumference, thus decreasing the dimension of the diameter 1-24 inch at any at every point on the inner circumference of the ring, or 12 2-24 - 2-24 = 12 in., the 2-24 decrease in the dimension of the diameter due to lateral expansion, offsetting the 2-24 inch gained by the 6-24 inch increase of the circumference. Therefore, the diameter of the inner circumference will measure 12 in., being identical to the measurement of the diameter before expansion occurred. Thus, when the lateral measurement (B. C. Fig. 1) of an iron ring equals the diameter of the inner circumference of the ring, (Fig. 1 D. E.) should any expansion or contraction occur, the dimension of the diameter of the

Fig. 4

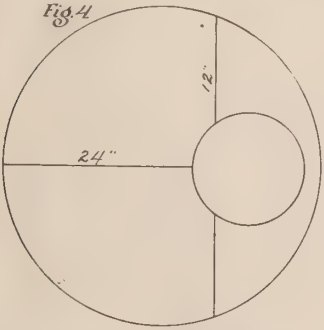
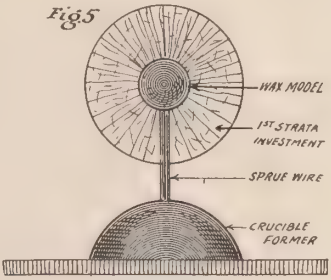


Fig. 5



inner circumference remains unaltered. Let Fig. 4 represent a ring, the circumferential dimensions of which are identical to Fig. 2, but with the inner circumference eccentric to the outer circumference to the extent as shown in diagram 4. The lateral dimensions of the ring being no longer uniform, should any expansion occur, it would vary in proportion to the changing lateral dimensien. Thus, where the lateral dimension measures 24 in. the expansion would be 2-24 in. in each direction from the mean line of expansion; or an expansion of 2-24 in. toward the center of the inner circumference, which would cause a decrease in its diameter of 2-24 in. at that point, and where the lateral dimensions measure 12 in. the expansion would cause an increase of 1-24 in. in each direction from the mean line of lateral expansion, with a corresponding decrease of the diameter of the inner circumference, at that point. Therefore, the lateral expansion would be of an unequal and varying degree throughout the ring, registering the same varying degrees of inequality upon the inner circumference of the ring. Hence, the inner circumference would no longer maintain the lines of a perfect circle, and the ring would be described as having become warped and the inner circumference distorted.

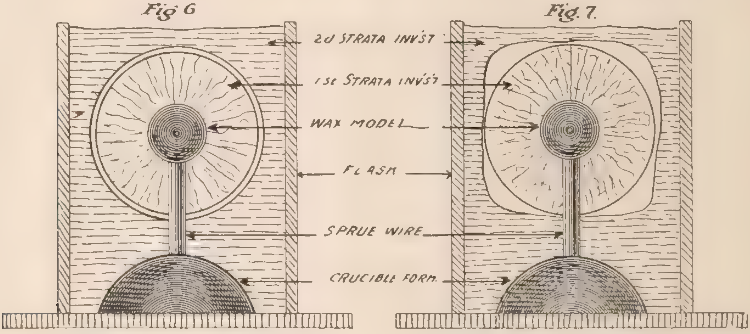


Fig 6
Fig. 7

Now these same laws, which govern the expansion of an iron ring, are also applicable to contractions; and also to any substance capable of exercising the property of expansion or contraction. For instance, investment material would be included, it having a tendency to shrink under the application of terrific heat. Suppose we desire to cast a perfect ball; if the wax model was surrounded by an investment of equal consistency, held by a flask in the form of a globe, (Fig. 2, could be applied as cross section) and the thickness of the investment equaled the diameter of the wax model, should expansion or shrinkage occur, the dimensions of the mould would remain unchanged. Again, suppose we desire to cast a perfect ball, but the model is placed eccentric to the external surface of the investment (to which Fig. 4 could be applied as a cross section) so that the investment would be of unequal and varying thickness, then should any expansion or contraction occur, it would be unequal in proportion; as the lateral dimensions are unequal and the effect would be registered on the walls, angles and convolutions of the mould, and the investment would be described as warping, and the mould as being distorted. Now again, let us suppose it is desired to cast a perfect ball, but in an ordinary flask used for dental purposes. Now if the wax model is attached to the sprue wire and mounted on the crucible former, and the model encapsuled by investment of uniform thickness, equal to diameter of the model, (see Fig. 5) and after this has crystallized, place the flask over it, and completely fill it with investment material, (Fig. 6). Then should any shrinkage occur during the process of obliterating the model, or fusing the gold in the crucible, it would be incapable of exerting any deleterious effect on the mould. And for this reason—that the continuity between the first and second stratum of investment is broken and should any shrinkage in the second stratum of investment occur—it being of unequal thickness—the effect of the shrinkage on the mass would be unequal; but the continuity between the first and second stratum being broken, the second stratum would draw away from the first stratum causing no distortion to it (the first or inside stratum) and should the mass comprising the first stratum subsequently shrink. This mass being of uniform thickness and equal in measurement to the diameter of the model, should any shrinkage occur the form of the mould would practically be unaltered. (Fig. 7). Hence, during the process of investing a model for the purpose of making a matrice or mould for the casting of gold or any metal under pressure, if the model is encapsuled by a stratum of investment of uniform thickness and equal to the thickness of the model, and be allowed to crystallize, and then this surrounded by the flask and enveloped by a second stratum of investment, it is, for all practical purposes, a geometrical impossibility to distort the mould, should shrinkage of the investment occur. The operator can exercise his ingenuity to an unlimited degree, in investing to the best advantage, models taken from compound approximal cavities including occlusal fissure cavities and copings, so that only an infinitesimal degree of distortion can possibly occur, should the investment shrink or even check.

CASTING: A RETROSPECT*

By Dr. J. G. Lane, Philadelphia

WHEN it first became known that certain areas in Alaska were rich in gold, ravenous prospectors and claim-stakers jostled with and fought each other in their mad rush over the coveted territory. This proceeding was carried on amid such a degree of excitement,—each person fearing that each and every other person might find something better than he himself,—that the entire field was sort of wallowed over, and worked too superficially to find out what conditions really did exist. After the place was thus imperfectly worked out in the first spasm of

*Read before the Lake Erie Dental Society, Cambridge Springs, May, 1910.

excitement, the same ground was again covered in a manner that was sane and sensible enough to unearth the real value of the environment. These same conditions obtain in our profession as often as new or novel procedures and methods are sprung upon us. And the more unique and novel the innovation the more this condition obtains. In this particular, casting has been an exception only in that it has been the most extreme case of this kind that has ever come within our observation. And now that the first grand rush for supremacy and record is on the wane, it is high time that we begin to look back over the field, take a retrospect view of what has been done, the theories and methods advanced, and to sift the real wheat from the chaff. This sifting and winnowing is likely to send many pet theories and ideas to the wind, -never to return; and indeed wisely so. The dental journals,—aye, and even textbooks on the subject in question, tell us all manner of theory, and methods in the art; many of these are so unreasonable, fallacious, and unscientific in their very aspect, that we cannot but assume that the exponent of such has in all probability arrived at his conclusion theoretically, rather than scientifically or clinically. While we know that the profession as a whole has been wondrously benefited by the result of all this effort, yet we cannot believe other than that many things which have been written and said on this subject from time to time, have proved to be an injury to the cause rather than a help.

Quoting Dr. C. S. Van Horn, *Dental Cosmos,* Vol. LI, p. 549:—"At present our work in this field is largely empirical; we have not practiced casting sufficiently long to have established it on a scientific basis; consequently we are too many times between the devil and the azure brine to know the how and the why. Some day the clouds will roll away." And in accordance with this thought, we think it high time that some of the overhanging clouds should roll.

The purpose of this paper, therefore, will be to point out some of the extremely opposite views that have been taken by various experimenters, who by experiments conducted technically, theoretically, scientifically, and clinically, have endeavored to reduce the art of casting to a true and proper basis.

Let us consider the impression method for inlay work as advocated by Dr. Weston A. Price, *Items of Interest,* Vol. XXX, p. 363 and 938, and by various other inlay workers. This method has adherents both in the clinic and in literature; the usual arguments advanced in its favor being the lessened possibility of distortion of an impression as compared to a possibility of the same in a finished pattern while being removed from the teeth or cavity; time saved at the chair; and less annoyance to the patient. Let us quote your essayist from the *Dental Digest,* Vol. XV, p. 436:—"The pattern for a gold inlay should be made in the cavity that is to receive the finished casting. This insures a better adaptation than can be had by any method thus far devised for making the pattern in a model. In the former method we have three transfers:—cavity to pattern, pattern to investment, and investment to gold. In the latter we have five transfers:—cavity to impression, impression to model, model to pattern, pattern to investment, and investment to gold; or if the casting is done directly in the model we still have four transfers by the latter method. In any transfer we can scarcely avoid losing detail and definition; therefore, the fewer the transfers the better the inlay is going to fit,—all other things being equal. Furthermore, there is vastly more possibility of distortion in an impression than in a pattern. This can easily be understood when we consider that the pattern is adapted to the interior of the cavity only; while an impression for a model is adapted not only to the interior of the cavity but also to the exterior of the tooth—as well as to adjoining teeth. Removal of such an impression from the tooth or teeth is almost sure to distort it; nor is there by this method any possibility of determining whether distortion is present or not until the inlay is made. By the direct method there is very little possibility of distortion; or if there is a suspicion that distortion is present, it can easily be proven and corrected before proceeding further." Instead of the impression method amounting to a saving of time in the chair, we believe it to take more time than the pattern method, because of the fact that two operations—one for impression, and another for bite,—are necessary. And if, therefore, as much time is consumed, the patient has not received the benefit of any spared annoyance. If,—as is advocated by some,—the model for such a case is to be made of amalgam, and the wax pattern for the inlay then made in the amalgam model, we at once find that the time consumed after the impression and bite have been taken, is very prohibitory,—in addition to the almost certain result of inaccuracy on account of too many transfers, and the possibility of distortion. It is, therefore, patent to all that the method which will insure the greatest accuracy of adaptation is the one which is most desirable to follow.

We believe that the more general use of inlays has done much toward educating the profession in general to appreciate a higher standard of cavity preparation. As to fundamental conditions which should obtain in this part of the work all seem to be pretty nearly a unit. In detail, however, there are wide differences. Let us quote Dr. P. B. McCoullough, *Dental Cosmos*, Vol. LI, p. 1175:—"No filling material has at its square edge the strength of the square edge of enamel. The beveling of enamel margins for protection is illogical when the weaker body is to provide the protection." Let us also quote Dr. Theodore C. Trigger, "Notes and Methods of Filling Teeth with Gold Inlays," p. 46:—"The marginal edges of the cavity should be cut straight and beveling avoided." The authority quoted repeats this statement on p. 59 of the same publication. Let us also quote your essayist, *Dental Cosmos*, Vol. LI, p. 434:—"The margin of a gold inlay being thoroughly homogeneous is reliable even at an angle of 65 degrees. This secures for the enamel margin the remarkably strong angle of 115 degrees.'' This seems to be just about the extreme opposite. However, we feel positive that we have seen our contention in this upheld clinically at all times, and we believe that proper clinical results are most important. For inlay work we disapprove of the extremely angular form of cavity preparation generally known as the ''Black Method,'' and by some inlay workers followed out in cavity preparation for inlays. We believe that the inverted cone and square end fissure burs have no place in the equipment for inlay cavity preparation. Quoting again from your essayist, *Dental Cosmos,* Vol. LI, p. 433:—''Sharp angles at the cervico-buccal and lingual aspects of an approximo-occlusal cavity have no point of merit whatever, and serve only to weaken the tooth as a whole.'' Also quoting Dr. Trigger from the publication mentioned above, p. 59:—''The enamel walls should not terminate too abruptly in short curvatures.'' p. 60:—''No definite angles are used in the preparation of cavities for inlays.'' And further down the page ''At the junction of the gingivo-labial and buccal surfaces the cavity should be cut in a rounded form.'' Dr. Trigger then goes on to state the advisability, and almost necessity, of sharp angular forms in these parts of cavity preparation for gold foil fillings.

Sharp angles at the points mentioned in the quotation of your essayist, have the effect of confining the area of possible fracture to *one* point; while if these parts of the cavity have a very slightly rounding effect the area of possible fracture is distributed over the area thus filled in, and *no one* point will have to endure the entire violence, e. g., a steel bar 3 in. in diameter having a point at its center cut down by a narrow sharp edged groove to 1 inch diameter will fracture more readily under load than if the entire bar (or even a longer distance in its center) were only 1 inch diameter. If there are sharp angles pointing outward from the interior of a cavity there will be similar angles in a casting mould; these are likely to receive slight abrasion and injury when the gold is cast past and against them, thus causing a misfit. The more angular the cavity the more difficulty is experienced in getting the inlay properly seated; the surplus cement must follow a more tortuous line to escape. We cannot see that sharp internal angles add in any way whatever to the degree of stability or fixation of an inlay after it is cemented in position; nor can we see how such could in any possible manner strengthen the operation and tooth as a whole. Furthermore, there is a possible element of inaccuracy of adaptation to sharp angles in making the wax pattern.

Much diversity of opinion exists in regard to the temperature the mould should have at the moment of casting. Quoting Dr. Marcus L. Ward, *Dental Cosmos*, Vol. LI, p. 1055:—''We are to cast our gold into moulds which have been heated sufficiently to eliminate all mechanical moisture and allow to cool down till they can just be handled with the hands without discomfort if we are to place the casting of gold on a practical as well as scientific basis*." Quoting also Dr. C. R. Baker, *Dental Review,* Vol. XXIV, p. 133:—"My first conclusion is,—that the only way to cast inlays is in a cold mould......With a cold mould we get a better specific gravity." Quoting also your essayist, *Dental Digest,* Vol. XV, p. 499:—"If the flask contains a mould of an inlay for a double compound cavity, or one that encircles or sits astride some portion of the tooth, it should be exceedingly hot at the moment of casting. This will give the minimum of shrinkage with a given investment." And on the following page,—"For inlays representing simple interiors, the flask need not be so hot as for the classes just described; but it must always be borne in mind that the lower the temperature of the flask the greater the shrinkage, and that the approximate amount of shrinkage desired shall determine the reduction of temperature in the flask at the time of casting."

Dr. Ward, in the publication quoted, does not seem to give any very definite reason for his belief regarding the temperature of the mould. Dr. Baker states his reason as being that a better specific gravity is obtained. We cannot see that Dr. Baker's figures for shrinkage (or expansion) in the publication quoted (pp. 130 and 131), mean very much unless the size of the pattern for each was given. On the following page we may read:—"The average size of the wax cubes is .1995 in." Unless the patterns had an absolutely uniform and stated size the table would not show much, except by computation if the size of the pattern for each experiment was given. The sizes are not given except as above. Experiment No. 3, Table III, reads:—"5 dwt. hot .2000, 18.308 Pecks," and conveys to us the information that 5 dwt. of pure gold was cast into a hot mould of Peck's investment, and that the resultant casting measured .2000 in. and had a specific gravity of 18.308. No figures are given for the size of the pattern for this particular casting. But if the flasked pattern was .1995 in. we believe that the result as stated is a physical impossibility so far as it pertains to the size of the casting. Experiments that we conducted along this same line to determine figures on shrinkage showed Peck's investment to have a very decided degree of contraction on being heated to a high temperature. Our figures for the particular experiment that might be placed in comparison with the above are these:—size of pattern .5000 in. (half an inch); temperature of mould,—red heat; size of casting,—.4957 in.; investment,—Peck's. This shows a loss of .0043 in. in a casting made in a mould as hot as the fusing point of the brass flask that contained the mould would safely allow. In eleven of the twenty-eight experiments of Dr. Baker we are given figures which show castings larger than the pattern (.1995 in.) anywhere up to .2030 in.,—or in one instance an increase of .0035 in., and this in a vacuum machine. Two of the tables given are the data for vacuum machines. The make of vacuum machine is not given, but we assume that it has iron flasks. Iron has an expansion equal to about one-half the expansion of Gold. And in order to expand enough to give a casting the size of a given flasked pattern would have to be heated to double the fusing temperature of gold. Of course, the investment would not stand this; and granting that it did, the casting would show a register only after the whole had cooled down to 2016 degrees—which register would be only half enough to neutralize the contraction of the gold. In our experiments the best result obtained in an iron flask, cast at red heat, gave a casting .4943 in. from a pattern of .5000 in. Two other machines mentioned in the tables are Taggarts and Jamesons. These both have brass flasks. Brass expands a trifle more than gold at a given temperature. With these it is possible to get a casting almost the size of the flasked pattern, but absolutely no larger. The highest reading we obtained on castings made in a brass flask, and at a temperature almost sufficient to fuse the flask, was .4992 in. from a pattern of .5000 in. We are strongly of the opinion that Dr. Baker's patterns were not the size he supposed them to be.

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*We are not informed as to just what this scientific basis is.

Increased specific gravity is, indeed, a most excellent feature in an inlay. And we do not take issue with anyone's statement that casting in a cold mould increases the specific gravity of the casting thus produced. We have not experimented along this line but we know that this condition obtains in grey iron. Grey iron cast against, or in, "chills," is so finely crystalized and hard that it cannot be cut except by grinding; and cannot be annealed except by remelting. If, however, the increased specific gravity of a gold inlay be obtained at the expense of accuracy, of adaptation,—which feature would undoubtedly obtain from shrinkage if cast in a cold mould,—we cannot but see that as a whole an already strong point has been strengthened, and a weak point made weaker. Namely, the density of any gold inlay is more durable than the cement line which surrounds the inlay. Increased specific gravity can be obtained to a sufficient depth on the masticating surface by means of round or corrugated engine burnishers.

Quoting again from Dr. Baker, in the article previously referred to, "If we have a step cavity with a good dovetail in the occlusal we find that that dovetail is going to draw the inlay into position towards the occlusal in such a way that when pressed down or hammered into place in the best possible way there will be at the cervical a heavy line of cement showing. Why is that? It is simply because the cavity is prepared with almost parallel sides, and if this inlay is the same size as the cavity, the cement will take up too much space, so that it raises it." Our observations in such instances have shown that the condition as described is not due to its close fit in the cavity and the interference of cement, but because of excessive contraction of the inlay. When the morsal part of such an inlay is seated on its foundation, the approximal part is not long enough to reach its destination at the cervical aspect of the cavity. Also that the part fitting into the dovetail (if this dovetail be a very pronounced one) is so contracted that it will not allow the approximal part to fit closely against the pulpal wall of the cavity except at the angle of the step. This observation may easily be made, and the facts cited determined, by placing such an inlay in the cavity *without* cement, and see exactly the condition referred to.

We believe that the shrinkage problem in cast gold inlays is not generally considered as important as its clinical results will warrant. Quoting from Dr. Ward, *Dental Cosmos,* Vol. LI, p. 1056:—"If, then, a filling 1-4 in. in diameter shrinks .0008 in. and is seated in the center of the cavity, there will be .0004 in. to be filled with cement on each side. If the casting be a compound approximal one for a molar measuring 1-2 in. we can only calculate a total shortening mesio-distally of .0016 in. Imagine, if you will, such a cavity being prepared with its walls inclining sufficiently to enable one to draw a wax impression, and a filling that had shortened from the extreme ends only .0016 in. Do you doubt its going to place? It will do it so closely that the naked eye cannot detect it, if the cavity has been properly prepared. These figures will not hold good for casts made in a red-hot mould, or if the gold is superheated. They hold good for casts made of gold heated above its melting point, and a little below its boiling point, and cast in a cool mould." Also quoting Dr. Price, *Items of Interest*, Vol. XXX, p. 933:—"In bridge work, because of the length of the piece, the cooling contraction not only makes the piece too short to reach the abutments, thereby throwing one of them out of register, but, if the attachment encloses a foundation as a ferrule for a root, its decreased diameter will not allow it to go over." In *Dental Cosmos,* Vol. L, p. 940, (Hinman), shows a cut of a bridge with two inlay anchorages. *Items of Interest*, Vol. XXXI, p. 815 (Reynolds) shows a cut of a similar bridge. Dr. Baker in the article referred to a number of times says:—"1-10000 in. in the size of an inlay larger than the cavity is almost fatal." In the bridges referred to, a shrinkage of 18-100 of one per cent. would put the inlay anchorages so much out of register that they would not seat properly, and possibly not even indifferently. The double compound inlay that registers a shrinkage of .0016 in.—as cited by Dr. Ward in the above quotation—would certainly not go into place unless it was forced into the cavity under a pressure sufficient to actually stretch it. This particular kind of inlay is the most difficult we have to make; and one wherein the shrinkage problem looms up most forcibly. For if the inlay is large enough to nicely sit astride the shallower central part of such a cavity without stretching, it would have to be at least as large as the cavity. If such an inlay is absolutely as large as the cavity it will not go in and seat properly for the other dimensions; and particularly so when we reckon the space necessary for the cement line. One dimension of such an inlay ought to be a trifle larger than the pattern; and the other dimension shorter. This condition we know would be impossible to obtain; and the only chance for us is to force enough stretch into it to allow it to reach over the interior of such a cavity.

We are firmly of the opinion that the investment has a very great deal to do with shrinkage, or lack of the same. An investment material should expand sufficiently on heating to follow up the expansion of the brass flask which contains it. With such an investment the shrinkage can easily be taken care of, except in large bridge castings. During the autumn of '07 your essayist conducted a more or less exhaustive series of experiments in an effort to formulate a suitable investment compound. The result of the experiments was given at a regular meeting of the Pennsylvania Association of Dental Surgeons during the same autumn, and also in a paper read at San Francisco in June '08:—a record of which is in the *Pacific Gazette*, Vol. XVI, p. 586. The best results we obtained were gotten in a compound made up of cast plaster 1 part, and very finely powdered silex 3 parts (by weight). In April and May, '09, we conducted a series of experiments to obtain data on shrinkage of gold castings. Castings made in Peck's investment compound showed 83-100 of one per cent. shrinkage; S. S. White's showed 18-100 of one per cent. and in silex and plaster as above given, we had only 16-100 of one per cent. shrinkage. These figures are for casts made in hot moulds. With the same investments and technique, except that the flasks were allowed to cool to a temperature which allowed handling with the fingers, we had a loss of 1.64 per cent. by shrinkage in the plaster and silex investment, and proportionately more with the other investments mentioned.

Quoting from your essayist, *Pacific Gazette*, Vol. XVI, p. 589:—"A smoother casting is obtained if the investment has been allowed to remain some hours, or even days, before heat is applied." While this idea is all right for the purpose stated we find that if a flask is allowed to stand a long time before casting we have a marked increase in the shrinkage of the casting made in such a mould. We, therefore, find it advisable to choose the least evil, and cast within a few hours, at most, after investing.

We, with others, believe that the time will come when the perfection of casting devices will make it possible for us to pre-determine the amount of shrinkage. Quoting Dr. Baker, *Dental Review*, Vol. XXIV, p. 130:—"I believe that the time will come when we can control the size of the cast we want by the temperature of our investment. When we get this work down to a certain point we will need a thermostat to tell the temperature of our investment when we cast in order to get the size we want." Quoting your essayist, *Dental Digest*, Vol. XV, p. 499:—"It yet remains for some genius to devise a form of casting apparatus with a pyrometer attachment to indicate the temperature of the flask while casting; this, in conjunction with an investment material of known physical properties could be a means of accurately determining the relative size of the casting."

We believe that a misconception is more or less generally extant in regard to why any pressure should be needed to place and hold the molten gold in the mould in casting. The commonly accepted idea being that the pressure used is needed because of air and gases within the mould. Quoting Dr. Trigger, *Dental Brief*, July, '09, p. 469:—"In order to force the molten gold into such a mould already described it requires a pressure exerted on the metal in the molten state to overcome the atmospheric pressure of air within the mould; that is, the force on the gold must more than equalize the air within to allow it to flow readily to all parts." According to experiments which we conducted we believe that air or gas resistance has so little to do with the need of pressure that it need not be taken into consideration. Quoting your essayist from the *Dental Digest*, Vol. XV, p. 498:—"The only reason why any pressure is needed is that the molecular attraction that holds a mass of molten gold in globular or spheroidal form is greater than the force of gravity; the gold, therefore, will not by force of gravity change its spheroidal form and flow down into a mould without assistance." The experiment which proved this consisted in preparing a flask with investment material in such a manner that the sprue opening extended entirely through the bottom of the investment and flask. The flask was heated to redness—as if for casting—placed on a support so arranged that anything that wanted to go through the sprue opening would have no interference from within or underneath, and gold fused in the crucible. There was, indeed, under such conditions, no air resistance from within or underneath; but gold fused in the crucible immediately over the sprue did not drop through the opening. Varying amounts of gold were tried: 2, 3 1-2, and 5 1-2 dwt. The first sprue opening tried was of standard size for practical work,—.055, or a trifle smaller than 15 gauge. The gold was heated by the oxy-hydrogen blow-pipe until volatilization began. If the flask was raised a couple of inches and set down with a jolt the gold would then run through. The size of the sprue opening was increased by known stages until it was .120 in. (almost 1-8 of an inch) before the gold would run down of its own accord when melted,—and even then only when heated to a temperature quite beyond its fusing point.

We believe that the margins of an inlay should be thoroughly burnished to the cavity margins as soon as cemented in, and before the cement has become friable. And in order that the burnishing may be effective as a means to an end the wax pattern must have been prepared without any overlap whatever. If an overlap is present, it is the overlapping part that receives the burnishing, and which is afterward cut away in the finishing. What is then the edge of the inlay has not been affected by burnishing at all.

The cementing and finishing of an inlay should be completed at the same sitting, and before the cement has attained its utmost density. We believe that it is possible for the heat caused by the friction of grinding stones to be in some cases sufficient to cause expansion of the parts involved; the inlay having a very different coefficient of expansion from that of the cement and tooth under it may cause some areas to actually break the heterogeneous union. Before the cement has become fully hardened its physical properties would allow for this unequal expansion without risk of fracture. This, purely theoretical, having no data on the subject; but we believe that it is possible for this condition to obtain. As stated earlier in this paper the desired specific gravity on the surface may be obtained by the generous use of engine burnishers of steel or agate, or still better, of corrugated steel.

After noting the vast differences of opinion that we have quoted and referred to, we may in our perplexity well wonder, as did Pape in his "Moral Essays"—"Who shall decide when doctors disagree?"

DISCUSSION.

Dr. E. B. Lodge, Cleveland, O.: I will take this opportunity first to thank the program committee for allowing my name to appear in connection with that of our essayist, Dr. Lane.

The subject is a most timely one and one which must elicit the attention of all dentists desirous of attaining the best results for their patients. In much that the essayist has said I most heartily agree, but there are some things which I cannot indorse.

Quoting from the essayist's paper, he says, "In any transfer we can scarcely avoid losing detail and definition, therefore the fewer the transfers the better the inlay is going to fit, all other things being equal."

Now, there are none who will not agree to this statement, as in it the essayist is perfectly right, but he tells us "the pattern for a gold inlay should be made in the cavity that is to receive the finished casting, that it involves but three transfers, cavity to pattern, pattern to investment and investment to gold." The model method where, for example, we have an amalgam model he tells us that we have five transfers, "cavity to impression, impression to model, model to pattern, pattern to investment, and investment to gold," and again to quote, "or if the casting is done directly in the model, we still have four transfers by the latter method."

Just here I must object; since the model made in the impression becomes a part of the investment, how can it entail another transfer of cavity surfaces than when a wax pattern is invested? Dr. Lane is in error for each process entails only three transfers of cavity surface. Then, too, in securing the occlusal dimensions the patient can close his teeth upon a piece of softened wax as readily as he can close upon a wax pattern within the cavity.

Few operators can carve a wax pattern for a compound cavity within the mouth in even ten times the time required to carve a very accurate one upon a stone model of the case, by which method is avoided the almost impossible task of carving exact contours and margins under the gingival tissue in a difficult environment.

This method obviates also the possibility of the wax pattern lifting up at one side when pressed down upon the opposite side as is so liable to happen in the direct method. I should like to ask further how the essayist would get the needed pressure on his contact point without extra work?

How by the direct method can an operator reproduce several contact points at once or even two adjoining and get them accurate. (Here I show set of models, one showing inlays with five contact points and two double compound cavities.) Just figure the difference in time carving them all up in the cavities and taking one impression of them all in a few seconds. Can any man produce as perfect contours by carving in the wet mouth as the finished model shows? All those restorations were inserted together.

How does the essayist hold the inlay in polishing? How, in polishing, does he prevent spinning of the margins? How, too, does he prevent the gold from shortening mesio-distally in a double compound cavity, and how does he correct for distortion of the cavity surfaces due to pressure upon the investment?

And, how is he able to differentiate between expansion, distortion of the investment and expansion of the cooling gold or decrease of normal contraction due to pressure exerted?

That a distortion does result from the pressure exerted upon the investment from within at the time of casting is a demonstrable fact. This is overcome by the use of the artificial stone model. Its rigidity enables it to withstand any amount of pressure that may be desired without distortion and consequent change of shape of the resulting inlay.

One point further in the advocacy of the model method, greater accuracy of adaptation is assured, particularly in compound and double compound cavities, by the taking of an impression in a suitable wax and specially adapted tray to hold same, and I believe there is less likelihood of distortion in the removal from the teeth of such a tray with its wax impression than there would be in removing a wax pattern directly from such a cavity.

Dr. Price has shown and I will quote his exact words, "the total contraction of a definite part of cooling mass of any metal or alloy can be materially lessened by the application of pressure to another part of the same cooling mass. This causes most of the contraction to occur in one place where not objectionable. As the contraction takes place the mass is moved by the pressure at a certain point to replace the shrinkage taking place elsewhere, but this can only occur so long as the pressure is greater than the resisting strength of the mass, which for available pressure for our use is only a few hundred degrees."

"By this means we can with only one-fiftieth of an ounce actual pressure reduce the total contraction in part of a mass of pure gold from 22.5 thousandths to 20.5 thousandths and with one-tenth ounces reduce it to 18 thousandths. With three pounds we may reduce it to 14 thousandths and with five and one-half pounds to 13 thousandths. Remember that the actual pressure is not represented by the surface pressure per square inch of a gas pressing upon it."

To quote still further, "The other methods of correcting this contraction are by modifying the alloy to have a minimum contraction (in which as yet but little has been done but no doubt will be) and by either enlarging the mold so that the cast will be the correct size when contracted, or by holding the metal, compelling it to stretch when cooling, or both. This can be accomplished by expanding the mold into which the cast will be made, and the latter only where the metal can be confined over a very strong form, as a ring around a very hard core.

"The expansion of the mold has been accomplished to a certain but not sufficient extent, by heating an investment material forming a mold and casting into it when hot. The best of these only allow an expansion by this method of six or eight thousandths and most investment materials very much less, if not an actual contraction on heating and this class of material on heating being chiefly silica and plaster, has so little resistance or strength that it is easily distorted by high pressure, absolutely limiting the use of the first named method for preventing the contraction, viz. by making high pressure on another part of the cooling mass, for they yield producing beads and distortion on the surfaces, which if on the cavity surfaces of the inlay, spoil it. The ideal conditions demand, then, that into the mold into which we cast, all surfaces that are to make contact with cavity walls and margins be so hard and strong that they will allow of high pressure without yielding and should expand either when heated or setting, or both to increase its dimensions uniformly about 15 thousandths which is one and one-half per cent.

"When casting upon this with an actual pressure of about two and one-half pounds we will have a cast within about one thousandth the dimensions of the original."

Now I might say something about the use of the cold mold, but suffice it to say that with the present investments molds contract on cooling from 5 ten-thousandths to 35 ten-thousandths, according to the investment employed, less than their size prior to heating, which only serves to accentuate the contraction of inlays cast in such a mold.

I have the opportunity here today to extol this fellow townsman and a most unselfish co worker in the field of dentistry, Dr. Weston A. Price, a man, who, like Dr. Black, was so worthily eulogized at yesterday's session by our fellow member, Dr. Friesell. Just as Dr. Black has brought out of chaos into systematized practice the field of operative dentistry by determining the causes of failure in the filling of teeth and in finding and proclaiming an adequate remedy so has Dr. Price been an indefatigable worker in the study of the subject of the gold inlay, not only is he a blazer of trails in this department of operative dentistry, but I am sure you will all agree with me that he towers head and shoulders above the rank and file even of the small minority of the profession who attend dental society meetings.

Some one has said, "Show me the books a man reads and I will tell you the kind of man he is." We will all agree, I think, that this holds true equally with the kind of friends he selects, and if perchance he be a dentist, even by the kind of instruments he employs.

I once was visiting a dentist's office and I happened to see his set of excavators and behold! what a mess of rubbish they were, but not merely that, they were so dull that I questioned whether they had seen an Arkansas stone since they left the manufacturers. I instinctively put that man down as one not to be emulated.

Now, if good instruments are to be the gauge of excellence, let us or those of us who have not done so, not only adopt the beautiful instruments of Dr. Black's designing founded upon experience, with angles and dimensions all scientifically determined with great exactness for the work they are to perform, but let us also adopt as an instrument for saving teeth, the artificial stone suggested and advocated by Dr. Price.

Closing remarks of the essayist.

MR. PRESIDENT AND GENTLEMEN: We are exceedingly sorry that train time for our departure is so near at hand that the discussion of the paper under consideration could not be prolonged; there being yet many points upon which we should like to have heard an expression of opinion. The operation of casting is as standard as any of our present day operations, and the problems which it involves merit the most thorough attention and research possible. A comparison of differences of opinion on the subject is,—from an educational standpoint,—second only to exhaustive scientific experimentation. In order that the result of experiments may obtain as a means to an end, such experiments must be, or have been, conducted along lines that are strictly scientific, and in absolute accord and harmony with such laws of physics as are known to be inflexible.

Dr. Lodge has indeed given us much material for consideration, and has presented it in true masterly fashion. His discourse is largely in the nature of an interrogation. We welcome the interrogation, and would have preferred it to have included many other points. We have jotted down the various questions asked by Dr. Lodge as well as we could get them in hurried fashion, and if we have failed to get them all will call upon Dr. Lodge to restate such as are not in evidence.

Dr. Lodge seems to be a firm advocate of the "indirect," or impression method, and takes exception to our statement that by the impression method there are too many transfers. He states that by casting in a model of artificial stone the number of transfers is the same as by the "direct," or pattern method. This is not correct. The little joker which he interposes in saying,—"The model made in the impression becomes a part of the investment"—almost conceals the truth. Unless it was *all* of the investment his criticism does not hold good, and the best he can do is three transfers for a part of his wax pattern, and four for the balance of it,—as against three transfers throughout by the direct method. The number of transfers by any method is of less consequence than the integrity, or questionability of such transfers, or the possible element of inaccuracy in handling the transfers, and we must still insist that—as stated in the paper—there is vastly more possibility of distortion in an impression than in a pattern, and for the reasons stated. We all know that a plaster impression is almost invariably broken while being removed from the teeth—even though that impression includes a very small area. Why does it break? Because the shape of the tooth, or teeth, is such that the rigid plaster cannot come off over larger portions of the tooth, or teeth, or follow varying axial lines of the enclosed teeth, without breaking. The same condition that breaks a plaster impression bends a wax or compound one. Granting that the outer surfaces of the teeth and the interproximal spaces are of such shape that an impression would draw without bending or breaking, it yet remains that the prepared cavities in those teeth must have exactly the same line of draught. This latter is a very exceptional condition, and when obtained at all it is usually at unnecessary expense of tooth structure.

The models shown by Dr. Lodge show beautiful work. Articulation and contact points just right. And the inlays fit the cavities absolutely. Naturally, having been cast therein, and not removed since. But, how can any one here determine by examining these models whether the impressions in which they were made were distorted or not? If this model is accurate then the impression in which it was made must have been accurate; if the wax impression was accurate then the teeth over which it was taken must have had no contour,—or at least could not have been larger at the coronal portion than at the gum line; all the teeth included must have had their axial lines parallel; all the prepared cavities must have had their lines of draught exactly parallel with each other, and all parallel with the long axes of the teeth. Can we conceive of finding such a condition in ordinary practice more than once or so in a lifetime? And unless the conditions as enumerated are present in a given case, distortion of a wax impression must be expected,—even with all the preventive possibilities that the neat little trays can provide.

Dr. Lodge tells us that a pattern can be made quicker in a model than in a tooth. In some cases this can easily obtain. But when we consider the extra operations,—such as taking an impression, taking a bite, making a model and fusing it, placing the model and bite on an articulator,—we are then, by the impression method, only ready to begin the same routine of operations that would entirely complete the case by the pattern method. Time is money. Either the patient or the operator must lose by the slower method.

Dr. Lodge asks how we would get the needed pressure on the contact point. We do this by inserting the sprue wire at this point. The sprue wire we use for ordinary work is 0.070 in. The extra pressure for the contact point is thus gotten without any extra operation, or apparatus.

Dr. Lodge also asks how adjoining contact points can be gotten by the direct method. There are various ways. One is—press pattern wax into both cavities; bite, rough trim, and separate the two with a thin ribbon saw; then finish each separately while the other is in position. Place the sprue wire in each at the contact point to get the needed pressure. Another method is,—first make one pattern, and while it is in place adjust an oiled matrix to the other cavity, and make the second pattern in it. (An "Ivory" matrix works very well for this.) Place sprue wires as stated. Still another method is,—that one cavity can be completed at a time.

Dr. Lodge asks how we hold the inlay while polishing. We do not hold it while polishing; having always maintained that the only proper place to polish an inlay is in the tooth after cementation. We do whatever shaping is necessary where the riser is cut off, while holding the inlay in our fingers; using great care to not even approach a margin. An inlay is not ready to be polished until it has been cemented in the cavity, and its margins burnished before the cement has become friable.

Dr. Lodge also asks how we prevent the gold from shortening mesio-distally. This is accomplished the same as for any other dimension. As stated in the paper, it is easily possible to make a casting in the investment given, that has a shrinkage of only .16 of 1 per cent. Granting that we have a casting that has a zero measurement (no shrinkage), we could not seat it in cement. Cement occupies space. As stated in the paper, one dimension of an inlay for a double compound cavity should be a trifle larger than the cavity, and the other dimension smaller than the cavity. There is as yet no means of bringing about such a condition. The pattern for such an inlay can be cut away from under the centre until the resultant casting will stretch enough to allow for what little may be necessary.

Dr. Lodge asks how we correct for distortion of the cavity surface due to pressure upon the investment. We obviate the need of any correction by using a definite pressure that does not distort the mould. We cast under a pressure of 25 lbs. (air pressure) per square inch. And having tested our investment up to 45 lbs. we know that we are absolutely safe at the former figure. Furthermore, high pressures are not necessary. The only argument ever advanced in favor of high pressure is that shrinkage can be partly overcome by that means. We have experimented with pressures ranging anywhere from sharp margins (5 lbs. per sq. in.) to the strength of our investment (45 lbs. per sq. in.) and in that range, any variation in contraction due to varying pressures could not be detected by a vernier micrometer. Inasmuch as by the artificial stone method a part of the mould is made of ordinary investment material, Dr. Lodge's question would apply to that method as well. Beads on a casting do not indicate a distorted mould. They indicate faulty technique in placing the investment material on the pattern. The same could obtain in placing the compound for an artificial stone model in the impression. Undue pressure will force, or distort, a mould as a whole. Not as beads. Beads will not form unless the spaces for them are already there.

Dr. Lodge quotes Dr. Price on pressures, contraction, etc. While we must admit that Dr. Price has worked out a beautiful technique on theory, yet we have not been able to obtain from his writings,—and we believe we have read most, or all of them,—certain data, or technique, that must of necessity belong in order that his technique may obtain as he claims for it. This data is,—*the temperature that the mould must have at the moment of casting, and a means of determining that temperature.* Dr. Price has ingeniously devised an artificial stone that has a permanent expansion equal to the normal expansion of gold up to its fusing point. Granting this equalization, then any rise in temperature in the flask at the moment of casting means an increase in the size of the casting over and above zero measurement. In order to roughly demonstrate to you the effect of variation of temperature in the flask at the moment of casting, we have here a small mandrel on which are two gold rings. The mandrel has a taper of 1 degree; the patterns for the rings shown were made at exactly the same point on the mandrel; both were invested in the investment material that we have advocated, and from the same mix, or bowl of batter. There could, therefore, be no possible difference in physical conditions thus far. One ring was cast in a mould as hot as the fusing point of the brass flask which contained it would allow, and the other cast in a flask that was cool enough to handle with the fingers at the moment of casting. You will notice that one ring drops to within the tiniest line of the point where the patterns were made, and the other ring stops about ⅜ of an inch further up. Therefore, in order to make a given technique complete, data for the temperature of the flask at the moment of casting should be given.

The figures given us by Dr. Lodge,—giving the effect of pressure as determined by Dr. Price,—are in error. Dr. Price obtained these figures by experimenting in casting with a centrifugal machine. In the same article in the *Items of Interest*, wherein Dr. Price gives us these figures, he states that in computing pressure in such a machine, the entire mass of gold in the crucible is available, and must be reckoned in computing the pressure on the sprue area. This is unquestionably an error. An inflexible law of physics teaches us that the only bulk of gold available for pressure and computation, under such conditions, is a bulk equal to the area of the narrowest part of the sprue opening, and the length of which is the height of gold in the crucible. All the remaining bulk of gold that fills the rest of the funnel-shaped crucible adds absolutely nothing to the pressure on the actual sprue area. Therefore, all the figures that are based on this theory and method of computation, are certainly in error. We recall having seen cuts of a device that was to produce perpetual motion, and will sketch the same on the blackboard. The device is a funnel-shaped receptacle, having a long curved neck or spout, that curves aside, upward past the body part, and again curving so as to have its final opening directly over and pointing toward the open top of the larger or funnel part. The belief was,—that water placed in the large part of the device would exert so much force through the small curved spout that a continuous flow would be established around and into the original receptacle. Of course it did not work, and for the reason we have mentioned.

As we stated a few moments ago, unless all these experiments are worked out on a truly scientific basis, and in strict harmony with the known inflexible laws of physics, such research can avail little or nothing, as a means to an end.

WHAT ARE DENTISTS AS A PROFESSION DOING TO ADVANCE THEIR SPECIALTY?

By Eugene S. Talbot, Chicago

"I hold every man a debtor to his profession; from the which as men of course do seek to receive countenance and profit, so ought they of duty to endeavor themselves by way of amends to be a help and ornament thereunto."—*Francis Bacon.*

"I judge people by what they might be,—not are, nor will be."—*Browning.*

"It is only the ignorant who despise education."—*Publius Syrus.*

"The very spring and root of honesty and virtue lie in the felicity of lighting on good education."—*Plutarch.*

"On one occasion Aristotle was asked how much educated men were superior to those uneducated: 'As much,' said he, 'as the living are to the dead.' "—*Aristotle.*

In these stirring times of medical activity and progressive evolution, the question naturally asked is, What is the dental profession doing to raise its standards of proficiency to meet the people's pressing demands? I have shown, in previous papers, teachers in dental schools are and have been asleep for the past thirty years and have not kept pace with modern biologic thought. It seems necessary, therefore, that the profession as a body should insist on certain changes in teaching methods, easy to accomplish and of great benefit to the profession.

In no branch of science today is there such an awakening as in medicine. Medical departments of universities are obtaining large sums of money for new buildings and equipment. The best teachers that can be found are employed and to those who devote all their time, good salaries are paid. These teachers often come from the poorer schools. This weakens the weaker schools still more until they no longer can compete with the better equipped institutions. The result is over sixty medical schools have united with university schools or gone out of business in the past five years. In a few years the hundred and fifty-five* medical schools will be reduced, in this country, to two-thirds if not one-half the present number. The stronger ones alone will continue under the law of the survival of the fittest.

This awakening is due to the fact that both the teachers in medical schools and the medical profession realize the laity require better services and this can only be brought about by better equipped schools and training of the student body.

There is, in this country, not only The Association of American Medical College but also a Council on Medical Education of the American Medical Association. This body is composed of delegates representing the State Licensing Boards; the State Medical Societies; the medical [illegible] universities; the Carnegie Foundation; the General Education Boards; the Medical Corps of the United States Government and invited guests. While the Council has no legal power, its influence is felt throughout the country. To give some idea of what the Council is doing I will quote from the proceedings of the last meeting held in Chicago, March first and second 1910 and which I had the pleasure of attending. The Chairman, Dr. Arthur Dean Bevan, in his address said:—

"We are called together under the auspices of the American Medical Association at this, the Sixth Annual Conference on Medical Education, which is also the First Joint Conference on Medical Education and Legislation, to discuss the conditions and needs of medical education in our country and to offer suggestions as to how we can in the shortest time and in the best way secure proper standards of medical education and proper control of medical licensure. With this end in view, the program of today has been arranged so as to present to you:

1. The existing state of facts which will be presented by our Secretary, Dr. N. P. Colwell, and myself.

2. The matter of proper examinations for medical licensure.

3. The relation of medical education to the general educational scheme.

4. The solution of the medical college question by placing the responsibility for medical education in the hands of the universities."

Further on in the address he says:

"The Council has made two complete inspections of medical colleges, the first being reported three years ago. The second inspection, which also included an inspection of the Canadian schools, has just been finished and has been very thorough and complete. The schools were personally inspected by the Secretary, Dr. N. P. Colwell and Mr. Flexner of the Carnegie Foundation and all possible information obtained, after which each school was marked on a civil service basis on ten points making a possible one hundred.

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*The Carnegie Foundation.

SYSTEM OF GRADING MEDICAL COLLEGES

These ten points were as follows:

1. Showing the graduates before state boards.
2. Requirement and enforcement of satisfactory preliminary education and the granting of advanced standing.
3. Character of curriculum.
4. Medical school buildings.
5. Laboratory facilities and instruction.
6. Dispensary facilities and instruction.
7. Hospital facilities and instruction.
8. Faculty, number of trained teachers, all time instructors, especially of the laboratory branches and extent of research work.
9. Extent to which the school is conducted for properly teaching the science of medicine rather than for the profit of the faculty, directly or indirectly.
10. Libraries, museums, charts, etc.

As a result of the second inspection the schools of the country have been divided in three classes: Class A. schools, marked above 70, which under existing conditions are acceptable. Class B. schools, marked between 50 and 70 which need certain improvement to make them acceptable, and Class C. schools, marked below 50, which need complete reorganization to make them acceptable. This list will be published in the near future."

As a result of the investigation of medical schools, an outline giving some of the essentials of an acceptable medical college has been prepared in the hope that it will be of service as a standard of measurement in the present rapid development of medical education now in progress in the United States.

This body composed of men from all departments of learning and the profession at large, meet every year, after a season of activity in hammering the life into or out of medical schools and report. No matter whether schools have gone out of existence, united with other schools or better facilities for teaching, they always report progress thus showing advancement is being made from year to year.

The methods of teaching as required today to bring a medical school up to modern standards are,

1. The student must have had four years in a high school superimposed on eight years of grammar school work.

2. A full graded course covering four years of at least thirty weeks each exclusive of holidays and at least thirty hours per week of actual work.

3. The first two years of work consists largely of laboratory work in thoroughly equipped laboratories in anatomy, histology, embryology, physiology, chemistry (inorganic, organic and physiologic), bacteriology, pathology, pharmacology, therapeutics and chemical diagnosis. These two years cover the foundation principles of medicine. Every person practicing on the human body, specialist or general practitioner, should take this complete course.

4. At least six expert, thoroughly trained instructors in the laboratory branches, salaried so they may devote their entire time to instruction and to that research without which they cannot well keep up with the rapid progress being made in their subjects. These instructors should rank sufficiently high to have some voice in the conduct of the college. There should also be a sufficient number of assistants in each department to look after the less important details.

5. The next two years consist of clinical work largely in hospitals and dispensaries, with thorough courses in internal medicine (including physical diagnosis, pediatrics, nervous and mental diseases), surgery (including surgical anatomy and operative surgery on the cadaver), obstetrics, gynecology, laryngology, rhinology, ophthalmology, otology, dermatology, hygiene and medical jurisprudence. The special work of the stomatologist should be added to these two years.

Prof. Victor C. Vaughn, of Ann Arbor, Michigan, in his paper on "The Functions of a University Medical School," among other things said,—

"Without men of proper intellectual and temperamental equipment no great work can be accomplished; consequently the school must be developed and directed by a faculty, the members of which have both the inclination and the ability to move forward in the right direction. A university professor should be possessed of a broad fundamental training, including both the humanities and the sciences, and on this as a foundation he should develop expert knowledge of the special subject in which he is to instruct others. His training should be both general and specialized. The former gives him a broad outlook and causes him to realize that all knowledge is correlated, while the latter is essential to every one who has any claim to leadership. Appreciation of productive scholarship in American university medical schools is growing, and the research now being done in some of the best of these schools begins to compare favorably with that of European institutions."

He further says, "It should be expected of each professor not only that he master his specialty, but that he labor to make worthy contributions to it. This it is that has made German medical science so preeminent. The old fallacy that a research man is only a dreamer, without practical knowledge, and consequently not a successful teacher, is slowly, too slowly, fading away in this country. The deepest inspiration for work comes only to the one who can occasionally drink from the head fountain of knowledge, and opportunity for research is as essential to the teacher of any branch of medicine as is air to the support of life. The university professor who does not devote a considerable portion of his time to honest and earnest endeavor to extend the bounds of knowledge is unworthy of his position and should be replaced.''

On equipment of faculties he further states, ''Fortunately the Council on Medical Education has formulated a somewhat detailed statement on this subject and to this I refer those who wish to investigate this matter. More than thirty years in a relatively small school and observation of others, both small and large, good and bad, lead me to say in general terms that the primary cost of a suitable building and its proper equipment for a school with an entering class of from fifty to one hundred students cannot now be provided for with less than one-half million dollars ($500,000). It should be understood that this does not include hospital facilities, which would multiply the above figures by not less than four. Moreover, it provides laboratories and class rooms of only the plainest kind, and it makes no provision for any equipment above that which is absolutely essential to high grade work. The yearly support of such an institution, again apart from the hospital, demands nearly two hundred thousand dollars ($200,000). With average tuition and laboratory fees, the annual income of a medical school should be multiplied by at least three, better by four, in order to balance the necessary expenditures. As I have elsewhere pointed out, a medical education worthy of the name is the most expensive professional training offered in this country. The time has passed when a group of physicians can combine and launch a medical school and give anything like proper training to its students. The medical school of today must have behind it private endowment or state aid. Even universities should not attempt to establish medical schools unless they can afford the expenditures mentioned above, and provide adequate hospital facilities besides. To maintain a medical school inadequately is, in a certain and large sense, criminal, because it means the sending out of unqualified practitioners and this means danger to the health and life of those whom they serve. I have elsewhere attempted to show that the state does wisely and serves its own interest in supplying the best medical education.''

Many other extracts could be made from the able papers presented at this meeting which are of interest to the practitioners of dentistry but enough has been quoted to show the feeling existing among the teachers and practitioners of medicine to show the requirements for the future education of medical practitioners. The views herein expressed are as applicable to specialists of the mouth as to specialists of other parts of the body.

What are we dentists as a specialty doing to advance our calling to meet the requirements of the people? Perhaps we can best appreciate our position in the world after seventy-one years of struggle for existence by taking an inventory of our assets and see what estimate the medical profession, the laity and even we ourselves place upon our calling at the present time. No matter what our feelings may be, let us look at the cold facts as they exist. We may then, by past experience and by lessons from modern medical teaching, be able to steer our bark out of the frog spittal and lily pads into clear water.

The student of dentistry after an expenditure of three years of time and money, associating part of the time with professional men, after graduation finds he cannot obtain one year's credit in a medical school although he has attended the same lectures in the same room by the same teachers and has sat upon the same benches with medical students. This is not only true in the ordinary dental schools but also in the best university dental departments. When he begins practice, he is looked upon by the medical profession, not as an equal, but as a man to be tolerated only although he is practicing upon tissues of the human body like all other specialists.

The dental surgeon in the army holds a very inferior position since the army surgeons attend to all conditions of the mouth, with the exception of extraction, insertion of artificial dentures, filling and the treatment of the diseased roots of the teeth.

The medical societies both of this country and abroad do not recognize us as a part of their profession and we are not admitted as members on an equal footing. The American Medical Association admits us as "dental members" just as pharmacists are admitted as "pharmaceutical members." The International Medical Congress now refuses to recognize dentists as a part of the medical profession.

When the national body (which is supposed to consist of the best men in the specialty) meets in annual session in any part of the country, the newspapers, in mentioning the fact, speak of us as "tooth carpenters and tooth pullers." They look upon us as a trade and not as a profession.

The census bureau in 1900 rated us as a trade and not as a profession. No amount of argument could persuade them to the contrary.

The law will not permit dentists to prescribe internally. The law recognizes us as a trade and not a profession since we are required to do jury service.

The Governments of Germany and England are considering bills prohibiting dentists from administering anaesthetics since we are not educated sufficiently to properly administer them.

For further demonstration of the fact that we are tooth carpenters rather than professional (educated) men, it is only necessary to read some of the papers and discussions as they appear in the dental journals from month to month to be convinced.

Strange as it may seem The Carnegie Foundation for the Advancement of Teaching, Bulletin number four, published in 1910, speaks of college and university schools of law, medicine and theology (professional schools) but does not mention schools of dentistry. This report enters deeply into the medical education of women and the negro. All schools have been considered, allopath, homeopath, eclectic, osteopath or what not. The report says, "It is equally clear that the student should be grounded in the fundamental sciences upon which medicine rests, whether he practices under one name or under another." But what about the poor old dental school seventy-one years of age? It is clearly shown this great institution with its tremendous capital does not consider dental schools of any moment from an educational standpoint but rather as trade schools.

In national, state or civic affairs, we have no voice on account of the lack of education, inclination or qualification to hold positions of trust.

Patients value our services as of so much per hour or by the number of cavities we have excavated and filled, extraction and insertion of artificial dentures and not by our knowledge of the human body or how to prevent disease. Our own estimate of our position in the scientific and medical world is nicely illustrated by the report of the Secreatry General at the last meeting of the International Dental Federation held in Paris, France, March, 1910 and also by some men in this country who have guided the affairs of schools, societies and shaped the education of graduates for the past thirty years.

The following is a copy taken from the April second, 1910, London Lancet, page 960:

"In the absence of Dr. Schaeffer-Stuckert, of Frankfort, the report of the secretary-general was read by Dr. W. Guy, dean of the Edinburg Dental School. The report, amongst other matters, referred to the question of the admission of dentists to International Medical Congresses, on which an official communication has been addressed to the Permanent Committee of the International Medical Congress now in session at The Hague as follows:—

"The Executive Council of the International Dental Federation has the honour to ask the Permanent Committee of the International Medical Congress to take into serious consideration its opinion of the admittance of dentists to, or their exclusion from, future International Medical Congresses.

If there is to be a Section of Stomatology or Dentistry, then, as the work of such a section will be to invite, to collate, and to discuss *every advance in dental science and art, and, as the great proportion of such advance is made by dentists*, it appears obvious that its work will necessarily be incomplete and its survey greatly limited, if it does not include dentists in its membership. The Council of the International Dental Federation would therefore urge upon the bureau of the International

Medical Congress the wisdom and propriety of admitting dentists to a Dental Stomatological Section, if it is desired that the work of such a section be authoritative and complete.

The Council of the International Dental Federation further submits the opinion that if the work of a so-called Stomatological Section is to be limited to the discussion of such matters only as are of medical and surgical interest and importance, as distinguished from dental, then it appears to it that a Stomatological Section is hardly necessary, as these matters can be better and more fully discussed in the Sections of Medicine and Surgery.

In short, it considers that scientifically there is no justification for the existence of a Stomatological Section which excludes dentists and hopes therefore that your committee will decide to strengthen and complete the Stomatological Section by admitting dentists." They admit they are not a profession but merely dental carpenters and plumbers.

To come from an international body, the preceding shows the feeling and estimate of dentists of their qualifications and position throughout the world. What a disgrace to those conscientious, hard working men who have the welfare of our specialty at heart.

If a "stomatological section which treats of diseases of the mouth is hardly necessary" but such "matters can be better and more fully discussed in sections of medicine and surgery" what is there left for dentists to do in a section of the International Medical Congress except to talk of boring holes, plugging them up, extraction and insertion of artificial ones which is purely mechanical? Surely such an organization should apply for membership in the trades union. This expression from an international congress is a wail, not from Rip Van Winkles of twenty years ago, but from the dark ages. Can you wonder the Permanent Committee of the International Medical Congress then in session at The Hague voted unanimously not to admit dentists?

Many American practitioners possess no higher opinion of dentistry than that expressed in the above report. Their remarks and writings are favorably compared with those of thirty, fifty and seventy-one years ago. Arrest of brain development has taken place and they are incapable of comprehending modern research work. When they discuss or write papers, the substance is parrot talk, which they learned in their childhood (dental student) days. There are a few men who talk but say nothing. Some of these men have shaped our profession in both schools and dental societies and still control their destiny.

With such a record as I have presented of our specialty as it exists today and the rapid changes which are now going on in medicine, is it not time that, as a profession, we awakened to the necessity of radical changes in our method of education for the future scientific practice of stomatology?

As Bacon has well said, "Every man is a debtor to his profession," it is high time we, as a profession, should awake to our duty.

When we come into the world, the Almighty expects us to do something to make the world better off for having lived in it. This is evolution. Evolution and degeneration go hand in hand, one cannot exist without the other. If we personally and collectively do not make the world better off by educating ourselves and those who are to follow us, we degenerate. We have accomplished so little in our profession in the last thirty years and the medical profession has progressed so rapidly, that in comparison, we have dropped far behind.

The ignorant peasant of Europe is not satisfied to have his children endure the hardships through which he has passed and forsakes country, environment, relatives and friends to cross the ocean to a new country where his children may have better surroundings. Why should not we who are sufficiently educated recognize our shortcomings and insist that those who are to take our places, receive such training that they will become the equal of any specialists in medicine and thus be able to serve the public in a satisfactory manner? It is true, there are some teachers in our dental schools who are striving for the welfare of our specialty. Many of these teachers are in the better schools (departments of universities) and there are some conscientious men in the commercial schools. The fact still remains that the better schools as well as the commercial schools do not aim higher than the degree of D. D. S. and are therefore on an equal footing so far as the finished product is concerned.

We, as a profession, at the present time on account of our neglect, have no standing nor do we deserve one. On the other hand, if we were properly trained, the scope of our specialty would make it the greatest in medicine. We would not then spend time discussing subjects which should have been learned in the dental school, but would put forth subjects that would hold the attention of the most learned men in the different departments of medicine and teach them the art of preventive medicine and how to observe the first symptoms of approaching disease, through the various mouth conditions.

Why has dentistry or stomatology not been included in sharing the benefits of the Carnegie Foundation Fund? Simply because the dental profession does not come up to the requirements. The people do not know that diseases of the mouth are as important and the symptoms observed therein more important than those in any other structure of the body. Shall we not glean a lesson from the subject under discussion which each of us can take home and profit thereby?

But to take a broader view of our specialty. New influences must be brought to bear upon the future education of stomatologists to remedy the present methods of teaching. Each dentist should canvass his city and State that every man may be of one opinion and like those grand cavaliers of Virginia, in their late enterprise pass a bill in the next Legislature requiring that every dentist who enters the State to practice after January first 1915 must possess a medical degree and the dental department will share equally with the medical department in all donations that are rapidly being given to improve our universities and medical schools. Let the weaker dental schools in each State consolidate with an actual university dental department just as many medical schools are doing now.

Every university medical department throughout the country is being put on a sure financial basis and a uniform curriculum adopted. Just as such medical schools as are connected with universities and have large endowments can exist in the future so is the prophecy of the dental schools, hence what is taking place in the evolution of the medical school must take place in the dental. Only those schools can exist that are actual departments of universities and well endowed. No school, medical or dental, can hereafter be run on a money making basis, as has been in the past. The fees of the students will not pay the current expenses and therefore, universities well endowed must do the teaching.

Here is the greatest opportunity of a lifetime. Every dentist should endeavor to place his city and state societies on a high basis, for the harvest is ripe and at the present time the gleaners are few. By so doing, future generations will be benefited and a big milestone will be placed in the line of evolution.

The future stomatologist must become the peer of other specialists and of those grand men who blazed the way, in our profession, before the first dental school was organized.

ANCHOR FOR FILLINGS AND INLAYS.*

By W. H. Pelton, D. D. S., Fostoria, Ohio.

EVERY dentist has experienced the difficulty of anchoring large fillings and inlays, particularly in proximal cavities, where the gingival and incisal portions are involved in the cavity. The failure of such fillings is due to the fact that we depend upon frail enamel and cement to anchor the filling or inlay. Naturally, these elements have a lesser resistance than the filling or inlay.

The anchoring device I here present, is so fashioned that it forms an interlocking union of metal with the tooth and filling that has as great a resistance as the tooth or filling. With the anchor you depend on a 22 gauge 18k. gold post set in the sound dentine to anchor the filling or inlay at the incisal edge and at the gingival portion one end of the anchor is set in the sound dentine. The anchor post is bent at a right angle and interlocks with the anchor, forming a positive lock of gold with the tooth and filling or inlay.

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*Given as a clinic at the Northern Ohio Dental Society, 1910.

We will consider first the preparation of a cavity in a central for a gold filling, it being unnecessary to devitalize. After removing decay, take sandpaper disc and cut the labial and lingual enamel parallel with the long axis of the tooth, then with a carborundum stone cut a flat gingival seat. Bevel the labial and lingual enamel according to your own idea and build up the pulpal floor with cement until it is flush with the labial and lingual enamel, leaving no undercuts or concave surfaces. Drill a hole (Fig. 1) in the gingival seat to receive one end of the anchor and drill a hole in the pulpal wall near the incisal edge at an acute angle with the pulpal wall. Place one end of the anchor in the gingival pit and pass the anchor post through the hole in the anchor and into the hole in the pulpal wall previously filled with cement. The anchor is so formed that flanges are bent at a right angle and extend labially and lingually. The gold is condensed between the pulpal wall and the flanges, and as the filling is built up each portion of gold is interlocked with the anchor. Non-cohesive gold can be used in the first two-thirds and cohesive in the remaining. This anchor is indicated in bicuspids and molars where large cavities are restored with amalgam. It is unnecessary to involve the enamel in the retention of the filling—the anchor will resist the stress and retain the filling.

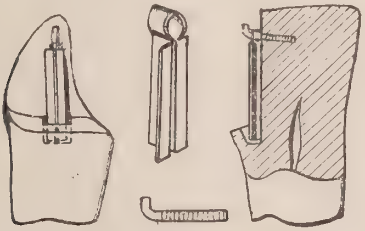

Fig. 1.

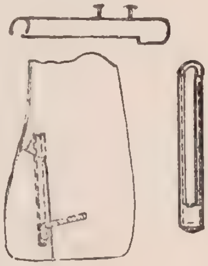

Fig. 2.

The casting machine created the greatest enthusiasm among the dentists, yet many a man has to regret that the cast inlay has been expensive to his practice, yet the failure of gold inlay in large restoration is due to the cement not being strong enough to resist the stress. The anchor enables us to go one step forward, which gives us an inlay with a mechanical retaining device. The cavity for inlays is prepared similar to the cavity in Fig. 1.

We will now consider an inlay in a central (Fig. 2).

Cement the pulpal floor flush with the labial and lingual walls, leaving no undercuts; drill a hole in the gingival seat with a round bur, to receive one end of the anchor, then drill a hole near the incisal edge for the post; now cement the post to place with the right angle part parallel with the long axis of the tooth and pointing toward the incisal edge. Continuing, place the tube part (Fig. 2) of the anchor in position in the cavity—seeing that the full round part of the tube interlocks with the post, then adapt the inlay wax and carve the wax to conform with the tooth. Now remove the wax model by pulling it straight away from the cavity (there being no undercuts the wax will come away without being distorted). The tube part of the anchor will come away with the wax. Invest the wax model with the tube part of anchor in place just as it is taken from the cavity. The tube must be filled with the investment (using a camel's-hair brush). When you cast, the gold will fuse to the anchor, making the anchor and inlay in one piece.

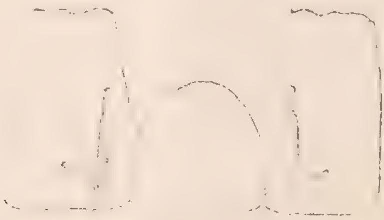

Fig. 3.

In using the inlay anchor in the construction of bridge work (Fig. 3) the cavity is prepared similar to inlay in Fig. 2. The anchors are placed in position and the cavities built up with the inlay wax: a suitable facing is then attached to the wax in the cavities, then the wax model is removed and invested as in Fig. 2 and cast. This will give you a beautiful piece of work that is sanitary and is constructed with less sacrifice of tooth substance than by any other known method.

HOW TO OBTAIN A SMOOTH, DENSE SURFACE ON CASTS.*

By F. L. Olds, D. D. S., Toledo, Ohio.

To insure smooth, dense surfaces on plaster casts, also on casts made of investment materials, we recommend that impressions of all-plaster be used; or, if modelling compound or wax be used, that a thin layer or coating of plaster be applied to the surface of the impression.

To prepare the impression for pouring a model of model-plaster (New York plaster), for vulcanite work, first give the impression a thin coat of shellac varnish. When this has become dry, which it will in about thirty minutes, give the impression a thin coat of sandarac varnish. This also should be given time to harden, about twenty minutes, after which we place the impression in water and allow it to become saturated before pouring the model. As an experiment, take any piece of plaster that has been lying around the laboratory for a few hours, and put it in water; bubbles will rise on the surface very freely, even through a varnished surface. Now, if freshly-mixed plaster or investment material were placed in a dry impression, the same thing would occur; bubbles would come from the surface of the dry plaster and a model full of holes, forced in by these bubbles of gas, would be the result. The reason for using the varnishes, as stated, is that the shellac acts as a filler on the fresh plaster surface, just enough being used to fill the pores and stain the plaster to a slight depth, leaving the surface, so far as the fine lines of the impression are concerned, just as it was before varnishing.

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*Given as a clinic at the Northern Ohio Dental Society, 1910.

If the impression were to be poured at this stage, with just the shellac as a separating medium, there would be difficulty in separating, as the plaster, in setting, creates enough heat to soften the shellac and thoroughly glue the two parts together.

Some are in the habit of using oil or soap to prevent this sticking together of the impression and model, but this is not good practice, as the oil or soap will unite with the fresh plaster, and a very poor surface on the model is sure to be the result. So we use sandarac varnish, thin sandarac varnish, as a second coat on the impression. All that is needed is just enough to give a smooth, glossy surface. We prefer a colored varnish, as it is easier to ascertain just how much is being used.

When the varnish has hardened, place the impression in water and leave it there until saturated, so that no bubbles of gas will rise up and fill the surface of model with the holes that we all have seen, and so that the dry plaster will not take up some of the necessary water from the fresh plaster, and give us a porous surface of poor quality.

Sandarac varnish is practically inert so far as the pouring of impressions is concerned and can be separated by carving away the impression over the ridge until the stain made by the shellac appears; then place the point of a knife under the edge and gently break away from undercuts and around teeth.

After separating the impression, the first thing to do is to give the surface of the model a good coat of castgloss, or silex, before anything else gets onto the surface. Hot wax or grease of any kind, if run over the surface before applying silex preparation, will prevent the plaster from taking up the silex, and a rough, porous surface on the palate of the plate will result.

After applying castgloss, wipe the model dry with a piece of cotton, rubbing hard enough to polish the surface somewhat. Hot wax or any other material may now be run over the surface of the model, and the plate will still come out with a smooth, clean surface.

For models of investing material for casting, we prepare the impression the same as above, with the exception that whatever relief is desired for the case should be carved in the impression; and if it is necessary to fit the plate a little closer at the periphery, just add a little wax to the impression, as the model cannot be carved when made of investment material without making a rough surface. The surface of a model for casting should be left just as it comes from the impression, without any alterations whatever.

The surface of any model will be just as smooth as the surface on which it is poured. If plaster is poured onto glass, a glassy surface is the result. If poured on a rough surface, the surface will be rough. Therefore, to have smooth models we must have smooth impressions, and the impression must be treated so that it will be practically inert so far as the pouring of freshly-mixed plaster or investment is concerned.

PREVENTIVE AND RESCUE TREATMENT OF THE MOUTH *

By N. S. Hoff, D. D. S., Ann Arbor, Mich.

(*Continued from December*)

From the fact that I have attempted to classify this disease you will infer that I intend to suggest rational and not specific treatment. I am frequently embarrassed by requests for my treatment, as though one could hand it out on any and all occasions much as the groceryman passes out carrots or lemons on request. I am often reminded of the reply that Dr. W. H. Atkinson is said to have made to the dentist who asked him how he would cure toothache, "Show me the tooth" was the sagacious reply. Having therefore given you my view of the disease I trust I shall be able to present also my views as to its treatment that may appeal to your judgment as logical and promising.

Parenchymatous Peridentitis is one of the most common forms of this disease and is usually of local origin, due to irritation and infection from calcic and mucoid deposits on the surfaces of the tooth. If there is much sensitiveness and a tendency to hemorrhage, a preliminary treatment with astringent disinfectants will make operative procedures more tolerant for the patient. For this purpose the patient may be put on a preparatory treatment for two or three days before operating. The mouth should be thoroughly washed with a fifty per cent. solution of commercial hydrogen peroxide for a few minutes followed by an emulsion of tincture of myrrh in water as warm as can be taken into the mouth and this rubbed into the gums thoroughly with the finger. This treatment applied at least twice a day for a few days will relieve the congestion and sensitiveness. Any good antiseptic lotion that will keep the mouth thoroughly sterile during the intervals will also be useful. Brushing of the teeth with denifrices should be avoided during this time. The surgical treatment can then be administered to advantage, and consist of removing from the crown and root surfaces all deposits of every kind down to the attachment of the living pericemental tissues. This operation should necessarily be done with properly designed instruments which can be effectively applied so as to produce the least possible injury to the gingival margin. If the operation is painful, pack the pockets with cotton saturated with cocaine solution but do not inject it. If the gum festoon can be preserved without laceration, quicker healing and less liability to recurrent disease will be assured. This desirable result, however, should not be gained at the expense of thorough removal of all calcic deposits and a careful smoothing of the root surfaces. This work requires great skill and patience, in fact it is an art that can only be acquired by practice and the ability to do and see things through the tactile sensations of the fingers; because many times the working point of the instrument cannot be disclosed to the view of the eye. Persons who have not a fine finger perception and almost infinite patience can never do this work successfully.

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*Read before the Odontological Society of Cincinnati, 1910.

The deposits in many cases, if calcic, are in such limited amounts that crudely formed or dull instruments hurriedly applied fail to discover them. As a rule when the symptoms exist we are always warranted in a thorough and complete curettement. In some cases the calcic deposit is so involved with the pericemental membrane, which is gradually becoming devitalized as to mislead us into an inaccurate diagnosis. It will be found that the removal of this devitalized membrane will reveal a rough condition of the root which must be made smooth before the tissues which come in contact with it will heal. This smoothing can be done with suitable scalers, the Smith and Ferris files if carefully used, but is most effectively accomplished by the Carr instruments.

The scaling and smoothing of the tooth surfaces should be done thoroughly and finally for each tooth or each surface at the first treatment if practicable, and no more teeth should be treated at any sitting than can be completed. The same principle being involved as in the case where the surgeon never reopens a wound unless it is absolutely necessary. A primary healing is much more comfortable for the patient and is less liable to recurrent disease. If but one tooth can be treated at a sitting and completed a more substantial gain is made than when two are only partially treated. When dentists learn the value of this treatment they will be just as willing to spend a whole hour treating one tooth as they now are to give an equal amount of time to a gold filling. In average cases it may be possible to treat at a single sitting one fourth of the mouth without overtaxing the patience of the patient, and to do this one will need a good equipment of instruments and know how to use them advantageously.

When the surgical treatment has been completed the tooth surfaces are not as smooth as they should be and may not be entirely free from deposits which will interfere with rapid and good healing. To remedy this we resort to the fine abrasives and detergent means applied with floss silk, tape, or wood polishing points. Finely pulverized pumice mixed with phenol sodique is the usual abrasive. The pumice furnishes the abrasive material and the phenol sodique the sterilizing and detergent remedy, acting because of its strong alkaline character as a solvent of all organic and mucoid deposits. The exposed surfaces may be reached with the tape, but the wood points are necessary to reach the surfaces beneath the gums. Care should be taken here also not to lacerate the gum margins more than is necessary. The final polishing should be done with whiting to secure insensitiveness. To reach very deep pockets or inaccessible positions we sometimes resort to chemical reagents which will disintegrate the deposits without injuring the living tissue which it is expected may be restored to normal functions. Lactic acid, dilute sulphuric acid, Robinson's remedy, bifluoride of ammonium and a host of similar chemicals have been used for this purpose. All such agents are capable of doing much harm if carelessly and excessively applied. They also tempt one to rely on them or to allow them to supplant the more valuable surgical procedures. I make some use of these reagents, but only when it is impracticable to secure results with instruments, for the reason that all wounds heal more satisfactorily when surgical or non-corrosive means are employed.

After the polishing all abrasive materials should be carefully washed out of the pockets and gum tissue by warm solutions of liquor antisepticus or other non-irritating antiseptic solution abundantly applied. An application of some soothing and healing anodyne lotion should then be applied. Every one has a favorite preparation for this purpose. If the tissues are painful, I use the following formula:

℞ Ether.
Chloroform: of each one ounce
Menthol, 30 grains
Tincture of Iodine, 1 dram

Mix and apply with a pledget of cotton to the gums operated upon.

Or this formula to induce healing and analgesia:

℞ Phenol, 1 part
Aconite, 2 parts
Iodine, 3 parts
Glycerine, 4 parts

Mix and apply to the gum.

The patient should be given an antiseptic mouth lotion to use several times daily until resolution occurs which will be in from two to three days. Then he should be instructed as to a careful and systematic mouth toilet. I usually select a powder with the proper abrasive character which will meet any peculiar requirement of the case. If there is a tendency to sensitiveness or mucoid accumulations a positive alkaline ingredient should be added to the usual powder and used until conditions changed and it may then be withdrawn. The powder should be used at night just before retiring and one of the paste dentifrices which has no considerable abrasive material in it should be used in the morning. The liquid menstrum of the paste serves to lubricate the tooth surfaces and prevents the adhesion of food or other extraneous substances passing through the mouth during the day.

I can not here take the time to give my instructions as to the tooth brush and its proper use. In my experience very few people know what kind of a tooth brush to buy, and have almost no proper conception of how to use it. This subject is one of too great length to take up here, and besides I am confident you are all studying this question and have your own ideas as to what is best. Most patients need at least two forms of brush and for some cases of irregular dentition several are required, all of which should be selected by the dentist with much care, and he should also teach the patient how to use them properly. Proper direction as to the mouth toilet can not well be accomplished without periodic inspection of the mouth by the dentist. Sometimes more harm than good is done by the improper use of a tooth brush and the dentifrices by a conscientious patient.

This treatment of the first division of Peridentitis will produce successful results in proportion as it is faithfully put into practice. Although there are as indicated in the various stages of this disease some cases where systemic conditions seem to account for the local conditions, I have not found a case where there was good evidence that systemic disease was the predominating factor in the cause of the local expression, which did not yield to the local treatment; not perhaps so readily as when the cause was entirely local, but always after continued prophylaxis treatment a good result was obtained. Where systemic treatment seemed indicated I should certainly utilize it. I once got a marked improvement in a case of persistent suppurative peridentitis by a change of climate and diet, which I was unable to get by persistent therapeutic treatment. We should resort to all measures which are practical and available to make easier and more secure the results desired. Systemic treatment, however, should be referred to the medical practitioner, who, because of his continuous dealing with systemic disorders, is more capable of handling them properly than any dentist can expect to be.

The second division, Hypertrophic Peridentitis, will yield to a similar treatment, although decided results are not so quickly secured because time is necessary for the absorption of the hypertrophied stroma, which is in this class the diseased tissue. Its development is slow and likewise will be its absorption. The exciting cause will be found usually to be a roughened root surface caused by what seems to be an acid secretion from the tissues. In bad cases the gum tissues are separated from the root deeply, and if there be any deposit, it is not found in masses but in granules. More frequently there is a roughness resembling a chemical erosion. Whatever the condition the treatment involves the smoothing of the surfaces which in some cases requires the removal of considerable root tissue and consequently the tooth is made quite sensitive. If considerable sensitiveness is developed and persists, the pulp should be removed. A complete curetting and polishing is necessary. The extreme sensitiveness if allowed to remain, will by its nervous reflex action on the peridental tissues aggravate the disease or the wound will not properly heal. The treatment indicated in addition is a stimulation of the absorbent organs and the tissues involved. This may be done by applications of local stimulating and astringent remedies. Iodine, massaging of the gums frequently during the day with astringent mouth lotions such as tincture of myrrh, powdered sulphur on the finger to produce friction are valuable means of accomplishing the desired results. Electricity or a suitable form of mechanical vibrator may be found useful. The pockets and affected surfaces should be polished as long as access to them can be obtained. Little other medication is of value in the treatment of this condition and the result although slower will be just as satisfactory as in the parenchymatous type. This condition is not usually accompanied with much pain and will, therefore, withstand rather strenuous treatment.

The third division, Suppurative Peridentitis, is perhaps the most destructive form of the disease and requires a more complicated treatment for its control. In this class there is always infection, and while it is not usually specific or contagious, in severe cases all the structures immediately surrounding the teeth are involved. Of course some teeth are always more severely affected than others, but usually it is those teeth which can not be kept clean by the vigilant toilet regime of the patient.

The first treatment is disinfection by chemical reagents and liberal irrigation with sterilizing solutions, to clear the operative field, as the treatment is largely surgical. As the infected areas are not excessively sensitive, as a rule, no anaesthetics other than frequent douches of hot water are required. The water should be as hot as is practicable to use and should contain some alkaline detergent, as lysol, or phenol sodique. A small stream applied frequently or kept running by an assistant will control the hemorrhage and keep the operative field clear and prevent infection of the healthy deeper tissues. The character of the calcic deposit which is practically always present, and very evident in most cases, will determine the manner of its removal. If in mass and readily accessible any ordinary scaler will serve for its removal. If small in quantity and deeply or obscurely located more complicated instruments and greater skill and patience are required. Probably the most obdurate are the so-called serumal calcic deposits. The best tempered and sharpened instruments will fail in some cases to dislodge this form. The Kirk instruments are valuable for this purpose as they can be used to disintegrate the deposit by forcibly pushing their serrated points over its surface until it is comminuted, when it can be readily removed with the files or Carr smoothing planes, or other suitable surfacing instruments. These deposits are many times located in places that are exceedingly difficult of access; as the bifurcations of the upper molar roots, the distal surface of the mesial root of the lower first molar which is usually grooved and is only accessible from the lingual aspect of the tooth, and many other conditions due to irregular positions of the teeth in the arch. Special instruments and patient manipulation are required in these cases. Sometimes a finely cut round bur in the right angle hand piece will help amazingly. In many of these cases a considerable laceration of the gum tissues is required to secure access. When required this is not only warranted but makes a thorough and efficient operation possible. The tissue should be carefully incised and preserved, so that it may be restored to place after the treatment is completed and surgically secured. A prompt and satisfactory healing may be expected if careful and thorough treatment is made. Where the deposits are deeply located on the labial or buccal surfaces a cross incision an eighth of an inch below the gum margin will make possible the easy scaling and polishing of a surface that would be difficult indeed to reach from the gingival margin without severe laceration of the gum and the formation of a wound whose scar would not soon form and would be always more liable to be opened by recurrent disease. By resorting to such expedients and with suitable resources, practically every surface of every tooth in the mouth is susceptible of treatment.

In some cases where the deposits have so encroached on the supporting tissues as to loosen the root attachment, the tooth may better be extracted and its surfaces treated and replanted providing its stability can be maintained until the tissues have healed sufficiently to support it. I am aware that this procedure is one that involves many conditions which make for failure, but its practice in these desperate cases is warranted in view of the fact that some of these cases prove to be very successful. If good judgment, care and skill are used, this operation can many times be utilized where failure by all other means is practically certain.

In some cases of this class this disease has made such extensive progress as to involve the alveolar bone and necrosis more or less extensive results. The treatment of this condition is, of course, surgical removal of all sequelæ, and the thorough curettement of the infected area. This may encroach upon the support of the adjacent teeth and mean the complete loss of some. For this I know no remedy; these are what I would term hopelessly involved teeth, and they must be sacrificed, rather than to hazard the general health of the patient. In less severe forms where the necrosis is superficial or slight, although accompanied with considerable suppuration, remedial treatment, to control the suppurative tendency and promote the sequelæ, may make necessary a less formidable operation, or none at all. The use of bone or calcic solvents in the treatment of this class of cases is of very doubtful value. The treatment is tedious, and many times undesirably destructive of the soft tissues, and in my experience can not be compared with the surgical treatment for successful results.

Associated with this division of peridentitis is a condition which I am unable to better name than to call it caries of the alveolus. The margin of the alveolus seems to be slowly dissolving away with little apparent suppuration. There is a liquid exudate of thin serum. The bone margin loses its acute form and becomes blunt. It is not soft nor insensible. It is denuded of soft tissue and the gum which overlies it has a sore or lame feeling. The treatment I have used here most successfully is a combination of the surgical and medicinal. Strong cauterants are inhibited because of the pain produced. Hydrogen peroxid as an effervescent disinfectant, followed by soothing antiseptics, stops the progress and allays the irritation. Irrigation with liquor antisepticus followed by application of Beck's bismuth and vaseline paste produce a comfortable reaction, and prepare the parts for surgical removal of the infected bone. This is best done with engine burs or suitably shaped spoon excavators or bone curettes. In these cases the calcic deposit on the roots is not pronounced, but the remains of the devitalized peridental membrane contaminated with microbic infection is evident. Its thorough removal and careful polishing of the roots will materially assist resolution.

I have purposely confined my treatment to the surgical method not only because I believe it the only treatment, but because I believe it promises the best results. The medicinal treatment of this class of peridental diseases is so confusing and unsatisfactory at this time that I don't believe any one can classify it for intelligent and successful treatment. I would not, however, discredit this form of treatment, as when indicated, material results come from medicinal treatment alone. A wise utilization of all efficient aids is many times required to reach the highest results.

The last division, Gangrenous Peridentitis, so far as its treatment is concerned, may as well have been considered along with the first division as the proceedings are quite similar. In this condition the bone affection and calcic deposits are not important factors, although both affections may be present to some extent. In this affection it is the pericemental membrane that is involved almost alone. In its mildest type it is seen in recession of the gums with discoloration of the uncovered roots, which are liable to become carious from microbic infection of the dead membrane which adheres to the root making a most favorable opportunity for the formation of the microbic plaques. The more serious cases, however, extend along the root separating the tooth from its attachment to the alveolus, frequently as a sinus, but sometimes the entire tooth will be loosened from its socket and become easily detached. These are the cases where surgical treatment is difficult and in some cases impracticable. Incipient cases with only marginal recession are easily treated by the regular prophylaxis methods of curettement and polishing. In these cases the progress of the disease can be effectively checked by persistent treatment. It should not be expected that there will be replacement of the lost tissue, but in a few cases I have seen considerable amount of new growth develop. If the affected surface can be treated and kept free from mechanical irritants there is some hope for re-development of the lost structure in part, at least the gum festoon or margin assumes a symmetrical and healthy form, where before it was irritable and ragged in appearance. When the disease has extended upon the root surface to any considerable extent beneath the gum margin it seems to develop with increasing speed, it seems to burrow its way toward the apical end of the root, and its sinus is so contracted that it is inpracticable to follow it even with a probe. It is evidently an infectious disease but not from a pus forming organism. As the focus of disease is in the pericemental membrane, a surgical removal of this membrane would seem the rational treatment and it is effective when practicable. Perforating the gum over the root at the point of progress and a radical operation will succeed. In many cases, however, this perforation is impracticable because of the location, and the only resort is to drug remedies. Disinfectants which will dissolve the membrane and loosen its attachment so that it can be washed out of the sinus, and which will not corrode the root surface are preferred remedies. The famous old Robinson remedy, equal parts of phenol and potassium hydroxid to which a small quantity of iodin is added, makes a good solvent and disinfectant application, applied by means of a small roll of cotton, or other suitable applicator. A solution of chromic acid, 25% aqueous solution, carefully applied, is also an efficient remedy. Other detergent agents of the alkaline class may be used. Unless there is calcic deposit or necrotic complications, the use of lactic acid or phenol-sulfonic acid have no particular action of value. The root roughness produced by the removal of the dead membrane or the result of bacterial fermentation should be removed by prophylaxis measures before any permanent cure will result. In cases where the single rooted teeth are completely devitalized by the course of this disease the tooth should be extracted, its pulp canal sterilized and filled, its root surface carefully polished, the root then replaced in its socket and held steadily in place until union occurs. In most such cases there is a good socket for replantation. If the tooth has elongated, the socket should be deepened and the tooth replaced in proper alignment and rigidly held there by metal splints and cement. There is no good reason why many such cases can not be saved to the patient for a considerable period of usefulness which are too often permanently lost for lack of knowledge or unwillingness on the dentist's part to face a charge of lack of skill. It is better to take the chance and commit a possible error than to lose an opportunity to serve a patient well, even occasionally.

I find that there is so much that should be said on this subject that my paper, already too long, would encroach excessively on your time and patience. I trust you may not think I do not appreciate your knowledge of the subject, because I have given you so much of technical detail, but I am writing this paper out of my experience and to my old friends, and I feel that I can take liberties with you that might not be appropriate elsewhere. It is these details that I have had to dig out for myself and I trust you can either better them in your discussion or point out my errors that we may all have the benefit.

The subject is a fruitful one for discussion and I have presented only one phase of it. I believe it is the most important advance dentistry has made in the last ten years, and that the near future will witness a tremendous change in the aims and objects of our profession. That we may realize that it is a higher and nobler calling to prevent the diseases of the mouth than to repair them is the goal to which our profession should and I believe is rapidly striving. If we can accomplish this for a considerable number of our people preferably for all of them—dentistry will become the leading branch of the noble profession of medicine, than which I believe there is none more worthy. In the meanwhile we shall be compelled to build our crutches as well as we know, but we should look for the coming of the time when this shall not constitute the bulk of our effort.

(To be Continued)

METHOD OF OBTAINING PERFECT JOINT IN LOGAN CROWN*

By B. S. Binford, D. D. S., Greenfield, Ind.

After approximately fitting a Logan crown to the root, cut off the end of a stick of inlay wax, not too thick; after warming slightly, run pin of Logan through the center of wax and gently press the crown to place, removing several times if necessary to trim off excess wax, and after having it properly trimmed and fitted, chill wax with cold water, remove crown with wax from root, insert sprue wire at the thickest place in wax, between the root and crown, invest and cast with gold or aeolite as you would an inlay. When properly fitted you will have a perfect joint.

The same can be done with a detachable pin crown.

A METHOD OF OBTAINING A SHEET OF THE INLAY WAX IN A SUITABLE SHAPE TO USE AS A BASE PLATE, FOR MODEL OF GOLD PLATE TO BE CAST.*

By Newton W. Hiatt, D. D. S., Marion, Indiana.

The inlay wax is melted in small cup, so that the depth of wax is about three-fourths ($^3/_4$) of an inch. A small round vial is then filled with cold water and soaped well on outside. The thickness of wax wanted depends on the number of times the vial is dipped into the wax. It should be dipped quickly each time. After accumulating the required thickness, the wax on bottom of bottle should be trimmed off, and a warm knife run through the

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Given as a clinic at Indiana State Dental Society, 1910.

wax the long way of the bottle, when the wax will come off very easily. By warming this in warm water it may be adapted to any shaped model, and removed and cast as any inlay or crown. The object of the cast plate, which is particularly adapted to the lower partial plates, cast in full, or with the use of the lingual bar, is to avoid the making of metal dies, which in some cases is very difficult, and even when the metal dies are obtained it is sometimes very hard to swage, on account of the gold buckling. The cast plate overcomes all this, and can be made to fit any model perfectly.

SEPARATE BASE FOR A CAST GOLD INLAY.*

By F. R. Henshaw, D. D. S., Indianapolis, Ind.

This applies to those compound cavities in bicuspids and molars, where it is extremely difficult to prepare the cervical portion without extensive waste of the labio-buccal and linguo-buccal margins. Prepare the proximal portion of the cavity so that it will draw, regardless of the occlusal portion. Make wax model and cast this portion of the filling. It is easy to see that you have obtained a perfect contact at the cervix, which is the crucial point in any inlay. Set this portion of the inlay and prepare the occlusal portion as for a simple case. Cast, and set the second portion and the result will amply reward for the additional labor.

PHYSICAL CULTURE FOR DENTISTS

By G. E. Harter, Toledo, Ohio

(*Continued from page* 1061 *December Summary.*)

THUS far, very little has been said about exercise, as such, although, of course; frequent reference, at least by implication, has been made to it. At the beginning, proper breathing will be found to be a conscious exercise. That is, will require, in most cases, considerable effort. But if persisted in—and if not persisted in, my time and yours will have been wasted—correct breathing will soon become quite as much an unconscious habit as its incorrect imitation now is in the cases of most men and women. And it is the unconscious habit that we are seeking to establish. It is not the occasional exertion that develops the sound body and the strong mind; it is the persistent practice that counts.

How long deep breathing must be continued consciously and intentionally before it becomes a habit depends upon the individual, but the principle is of universal application. Long deep breathing indicates strength, and strength that lasts and may be depended upon. In the animal kingdom it is found that the comparative strength of individuals is almost always in proportion to the length of the respiratory movement. The elephant, probably the wisest and bravest, as well as the strongest, of the animals, breathes six to eight times per minute; the mouse, probably the weakest and most timid in proportion to its size, breathes one hundred and twenty times each minute.

Given as a clinic at Indiana State Dental Society, 1910.

Among men it long has been known that long, deep, slow breathing indicates strength; not only strength of body, but strength of mind and soul. Among those who have made more or less a study of the psychology of fear, it is known that the deep, full breath indicates and accompanies self-confidence, courage, poise; while the short, choppy, panting breath always accompanies, if it does not indicate, the lack of these qualities.

I once knew a man who had acquired in his paternal home a deep-seated and dominating fear of storms, particularly of storms accompanied by lightning and thunder. In the presence of even the slightest manifestation of this common, and to most, beautiful expression of the powers of nature, this man became again an infant.

Although occupying an important official position in a large manufacturing concern, and the superintendent of its factory, the most distant flash of lightning or the lightest roll of thunder destroyed completely his self-control, quite visibly present and in command at other times, even in the handling of the largest and most complicated business propositions, rendering him not only helpless, but an object of contempt in the eyes of those about him and under him in the business world.

Even a cloud of unusual dimensions or darkness, would send him scurrying about over the factory, closing windows and bolting them, leaving no crack or cranny open to the slightest breeze.

Upon one occasion while seated at his desk busily occupied, Jupiter Tonans stole a march on him. Without a moment's warning his desk light went out with a snap, a flash of violet lightning whisked across his room from door to window, and a sharp, clear, resonant crash of thunder shook the building for an instant.

Instantly this dignified, able and successful business man slid out of his chair and disappeared under his desk, where he remained, white and quaking with fear, entirely unmanned, until assured that there was not likely to be a repetition of the phenomenon.

Yet this man, so powerless, seemingly, to control his fear upon such occasions, was completely cured in a month or two, and came, in a year or such matter, to enjoy the thing that he once, and for nearly half his normal life, had feared so completely and so honestly.

He was taught to breathe properly, especially when a storm was seen approaching; to stand and watch the thickening clouds, listen to the rising wind, and to count his pulse during the intervals between flashes of lightning and the following detonation, while filling his lungs to their fullest extent, holding the breath as long as possible and exhaling it slowly. The result was all that could be desired. Many students of such phenomena are already ready to say that physical fear is impossible in the presence of deep, full breathing—of the proper and normal control of the breath.

There seems to be a physiological reason for such results. In the presence of fear the breath comes in short, choppy gasps; the heart beats rapidly and weakly; there is lack of co-ordination and control throughout the entire organism, while the mind, having no fixed center, becomes confused and loses its command. Fixing the attention (notice the last two syllables of that word, "tension"), upon some point, in this case, the lungs and their movement, corrects the wandering of the mind, restores it to its kingship, and holds the entire body well in hand.

Certain movements combine very well with the respiratory training that has been recommended. These are to follow, but you are now to be told how to perform that first and simplest of all physical feats, but which, simple and necessary as it is, is utterly unknown to, or, at least, not practiced by one man in ten thousand. You are to be told how to stand.

A somewhat exaggerated mental picture of the standing posture of, probably, ten persons in every twelve, may be formed by looking at the capital letter S. Let the left side of the short upper curve represent the average curved, bowed, forward-sagging back and shoulders, while the right side of the lower curve represents the protruding, swaying, unsupported abdomen. Just bear this figure in mind the next time you are in a crowd. Watch the men coming into the dining room at your club or restaurant; try to get a square side-view, and then say if the picture is too greatly overdrawn.

Shoulder and abdominal muscles have been allowed to grow flabby by want of use; the chest is fallen in or flattened because of incorrect, scanty, rapid breathing; while the weight of the body, which should be supported by the muscles, has been allowed to sag down upon the bony structure, compelling the skeleton, the foundation, to do the work of the superstructure, the arches, braces and trusses—the muscles. The ribs, unable to bear up under the weight imposed upon them, contract, cramping and crowding the vital organs within their cavity, making normal, or even fairly comfortable living impossible. If such people could be made to realize, inwardly digest and consider what a long train of physical ills attends this condition, it would be remedied at any cost, particularly as the remedy brings with it such increased joy of life and of every function as to make one wonder that any are satisfied with the half-life possible otherwise.

The skeleton has enough to do without taking on the additional burden thrust upon it by the incorrect standing posture. The muscles are intended to hold the body in position, to hold it taut and snug and elastic. Upon them depends the important work of maintaining the proper relation between the chest bones, the spine and the pelvis, and the relation of all of these with the upper leg bones, at the point at which they enter the sockets in the pelvis, forming what is called the hip joint.

Of late there may have been noticed a series of advertisements referring to a method of increasing the height. If every man and woman carried the body correctly, there would be no occasion for such instruction. The height depends so much upon this and it is so generally unknown or neglected through sheer laziness or indifference, that there is ample room for improvement. If we use the muscles of the hips, abdominal region and the back, instead of allowing the trunk to settle down upon the pelvis and legs, we should all be taller, to say nothing of added shapeliness, poise and strength.

Even our ideas of physical comeliness have degenerated. Ask several of your patients to stand at your window and point out the best figure of man and woman that passes; at least eight in every ten will choose a figure that is so far below the standard of a hundred years ago, to say nothing of the standards of the Greeks and of the modern physical culturists, as to be almost ludicrous. Selection will, in a vast majority of cases, be based entirely upon false ideals arising from mere use and wont. The things that we are accustomed to seeing become impressed upon us to so great an extent that it is possible to imagine a Caliban passing for a superior figure of a man in the eyes of those accustomed to looking with tolerance, if not even with affection, upon the exaggerated capital esses that throng our streets and our drawing rooms.

I recently overheard an argument in a shoe shop between two customers upon the relative esthetic merits of the flat and the arched foot! Shades of Phidias and Beau Brummel! If this state of affairs continues the time can be foreseen when the crooked back, the swaying stomach, the bow-legs and the knock-knees will be esteemed as patterns of grace and elegance.

When it is remembered that our ideas of grace and beauty have their origin in efficiency, just as the demands of polite society have their foundation in ethical considerations; that what is now considered merely beauty once was esteemed for its health-giving, life-conserving and strength-manifesting characteristics, this decay of the esthetic sense most certainly is to be lamented. Educators should be aroused to the importance of imitating the Greeks so far as to instil into the minds of the young a proper knowledge of the lines of beauty and grace; which is only another name for the lines of physical fitness and efficiency. Not one young man in a thousand knows whether he is beautiful or ugly; whether he stands properly or otherwise; whether he has within his organism the properly developed parts and organs that render him fit for the battle of life and to pass the life-stream along to his successors or otherwise.

To learn whether or not you stand correctly, walk up to a door, or the wall, or any other perpendicular object. Touch it with the toes, and stand "naturally;" that is, stand as you ordinarily do. Now note which points are in contact. The chances are that the abdomen only will be found to touch the object. If the exaggerated sway-backed, pouter-pigeon, Grecian-bend (particularly notable as having nothing Grecian in it) posture has been cultivated, the abdomen will not touch, but only the lower point of the breast-bone or chest.

If you stand correctly, the nose, chin, chest and tips of the toes will be in line, all in easy contact with the wall or other object when the feet are turned outward at an angle of sixty degrees. Not only is this the most graceful position for the body, but it is the one affording greatest fitness, efficiency, balance and ease; it is the one that allows all of the interrelated parts to fall easily into their natural positions, with the desirable results of greatest endurance and freedom from fatigue.

In my next paper an effort will be made, by illustrations and instructions, to tell you how this desirable standing position may be obtained. In the meantime, it will be helpful if some of my readers will try the experiment and write me, stating their present physical attitude with reference to the standard set up.

(To be continued)

THE NECESSITY FOR AND RELATION OF OUR LOCAL, STATE AND NATIONAL ORGANIZATIONS.*

By H. C. Brown, D. D. S., Columbus, Ohio.

IN treating this subject I shall use the term "organization" as one embracing the various dental societies and associations, and shall attempt to show the benefits of such organizations, their relation to each other, and some of the influences which they wield in advancing the dental profession, and likewise educating the public to a better appreciation of the importance of the teeth and the necessity for observing at least ordinary hygienic precautions in this connection.

Dentistry, in a crude way, has been practiced for many centuries, but it is only in recent years that any professional recognition has been accorded it. The first dental college was founded and the first dental journal was published in 1839; the first dental society was organized the following year. These three important steps are merely cited to forcefully remind us of our brief professional career and emphasize our rapid progress.

Never before was so much significance assigned to the relation of the oral cavity and its organs, when considering the physical welfare of the individual, and never before was the question of conservation of our natural resources as forcefully presented to us; both of which meet with general commendation when once we are educated to appreciate their importance and the true existing conditions, as well as that by certain well regulated precautions those "organs" and those "resources" can be conserved and beneficially utilized for a much longer period of time than would otherwise be if these conditions are not recognized, corrected and safeguarded.

While our profession is young and our progress somewhat remarkable, yet through the fact of our indifference to efficient organizations we not only retard our advancement but naturally handicap our profession from

*Read before the West Virginia State Dental Society, Oct., 1910.

being accorded the recognition to which it is justly entitled. One reason which can be assigned for this seeming indifference is that most professional men are deficient in business qualifications or experience and do not fully appreciate the necessity for being well organized. If I was asked to designate the profession most conspicuous in this deficiency I would name that of dentistry; not that I consider those of our profession an inferior class of individuals mentally, but that a large per cent. of those studying dentistry begin young and have only limited means, which compels them to practice strict economy prior to entering college, in college, and in the early years of practice. Only a small per cent. of dentists ever attain a practice higher than that of a comfortable living, and then only after some years of close confinement in a most limited field, from a business viewpoint. Therefore, we are creatures of circumstance, in one sense, and environment in another, and any solution that will assist in correcting some of those shortcomings should receive most careful consideration. The first important step in this reformation is to effect a better organization in the profession, and the successive steps will naturally be determined and systematically adjusted.

The centralization of manufacturing interests; the aggressive combinations of public utility corporations; the specialization in the mercantile and professional world; the organization of the many and varied branches of labor, the different religious sects, the opposing political parties and factions, the secret societies; in fact, every class of individuals of any considerable number having mutual interests and sympathies are, and have been, quite active in perfecting organizations in order to not only develop this "interest," but when once developed, to see that their rights are fully conserved.

While this is recognized as an age of centralization, specialization, and organization, the dental profession has been most conservative in its attitude to these. This position of modesty has its commendable features; but when we realize that we have not been aggressive enough to best advance our profession and at the same time advance and protect our interests, then it is time that we change our views, if that be necessary, and lay aside our mock modesty.

I am of the opinion that there can be more general benefit derived through efficient organization in our profession than in any other of special interest. I appreciate that this is a broad statement, and some may say a selfish one; but when we consider that the average dental meeting is an abbreviated post graduate course, and that the public receives the indirect benefits derived by those in attendance, then we recognize that such a statement has good argument in its support.

Such dental meetings contribute liberally to the "finishing touches" of the debutant in the dental profession, and very naturally aid a much larger class who have been in practice for some years by keeping them in touch with the advancements as made from year to year; also, the dentist enjoying a full practice who takes advantage of these meetings, not only to observe the progress made by others, but to contribute some original idea or successful method used in his practice; therefore he is doubly benefited by being a contributor and a receiver. The clinics given at such meetings make it possible to clearly demonstrate in detail the advantages of the practical ideas presented, and the opportunity offered by these diversified clinical demonstrations is, in my opinion, not equaled by any other special organizations, and the dentist who does not ally himself with this work fails to recognize that he is not only unjust to himself, but those he serves professionally, and indirectly those depending upon him for support.

In addition to the clinics, the scientific and practical papers, together with their discussions, stimulate any progressive and conscientious dentist. He returns home with new ideas and imbued with a feeling that his chosen life's work does not encroach so close to drudgery as he had often suspected. He has more respect for his profession and likewise his services. He feels that his best efforts are none too good for his clientele, and he is better prepared and more particular in disseminating information to their mutual advantage; thus their relations become more harmonious than formerly, with decided benefits to both. The dentist who neglects to take advantage of such opportunities for advancement unconsciously, but gradually, steps aside to make room for some one who keeps in closer touch with his profession.

I have frequently been told by good and well-meaning dentists that they are too busy to attend dental societies. I usually tell them that such conditions may occasionally interfere, but that our ''busy men'' are the ones most regular in attendance and active in the work of such societies. If you desire anything done in this connection it is advisable to request the ''busy man'' to do it. However, I would make one exception to this, and that is the conscientious and capable young man who, early in his career, aggressively takes up society work, as he only needs a limited amount of time until he will be classed as a ''busy man,'' and doing his full share of work in our advancement.

In organizing our profession so that the best results may be obtained, we should first have the local organization, whose jurisdiction should embrace enough territory and include a sufficient number of dentists to form an active society. In my experience the number of dentists required to effect such an organization varies in different localities. In less populous sections, with meager transportation facilities, it would be advisable to be content with a smaller membership than should be attempted where conditions are more favorable.

Under the least favorable arrangements a society of ten or twelve members, working in harmony, should accomplish good results; but ordinarily I would advise that the jurisdiction be extended sufficiently to permit of an organization with a larger membership.

The local society should meet often enough to keep up an active interest. By coming in personal contact with those practicing under similar conditions you become better acquainted, and frequently to the mutual advantage of all; also, you may discover good qualities in a fellow practitioner that were never suspected.

The local society is the keystone to a better organized profession. Frequent meetings with a limited membership necessarily requires active work from a larger per cent. of the society membership, which gives opportunity for the development of those showing indications of ability for certain phases of our work and upon whose shoulders may rest great responsibilities when considering the future of the profession. The local society should be the portals through which membership in the state and national is attained, and sufficient dues collected through the local to cover membership in all three. The state society should publish their proceedings in as prominent a journal as is possible. The national association should establish a national dental journal, and this, together with the one publishing the state proceedings, should be furnished to the membership without cost, other than that paid as dues, which should be as low as can consistently be made.

I am convinced that if we are well organized $5.00 per annum would cover dues in local, state and national, and secure at least a national dental journal, and in some states the journal in which their proceedings are published.

The annual dues of $5.00, as suggested for the three organizations, might be divided as follows: $1.00 for the local, $2.00 for the state, and $2.00 for the national. There are necessary expenses connected with the state and national organizations which are not required locally. The expense incident to organization work generally, legislation and the promotion of those measures considered advantageous, are usually met by the state and national; each, however, being dependent upon the other and giving harmonious and united support in behalf of such advocated policies, when once definitely outlined.

As the public becomes better educated in the question of sanitation and hygiene it will demand equally advanced consideration, and the dental phase will not be overlooked. In fact, they are better informed at this time than some of us are willing to admit. Thus the usefulness of these organizations, as outlined, is emphasized, and their dependence upon each other is the logical deduction; since, by hearty co-operation, we can overcome obstacles which, as individuals or as non-co-operative societies, we would hesitate to undertake.

Therefore the necessity for a more representative national association is becoming more apparent to all, and interest in this respect has been rapidly increasing for the past few years. The program presented, the attendance, the increase in membership and the general interest manifested by those present at the last meeting of this association, held in Denver, Colorado, July 19-22, is an evidence of the correctness of this statement. The indications are that the 1911 meeting, to be held in Cleveland, Ohio, July 25-28, will surpass all former sessions, and that a new constitution and by-laws will be adopted, which will permit of this association becoming a more representative one, with a decided increase in membership and publishing a national dental journal.

A committee on revision of constitution and by-laws made a report at the Birmingham meeting in 1909, but definite action was postponed for the time being in order to get expression from the various state societies, approving the plan as outlined or suggesting such changes as might seem best to them.

As corresponding secretary and chairman of the committee on state and local societies, I was directed to ascertain the attitude of the state societies upon this question, and a systematic correspondence was inaugurated with that purpose in view. I submitted with this correspondence a list of questions, and requested the secretaries to furnish this and the other information desired upon the blank where space had been reserved for that purpose.

I herewith incorporate that which was submitted:

"——————————....., 1910.

THE REPORT OF THE .... STATE DENTAL SOCIETY
TO THE NATIONAL DENTAL ASSOCIATION.

Does your society, by official action, favor a revision of the constitution and by-laws of the National Dental Association with provision for state societies becoming components thereof; annual dues not to exceed two dollars ($2.00) per member, which includes subscription to the National Dental Journal?

Will your society become a component organization of the National if such a constitution and by-laws is adopted?

If the above is not agreeable to your society, what suggestions do they offer which will put the National on a basis of greater usefulness?

What annual dues do you collect?
What is your present paid membership?
How many in attendance at your last meeting?
How many *members* in attendance at your last meeting?
Give approximate number of dentists practicing in your state.
Give name and address of newly elected president and secretary.
President:
Secretary:
Give place and date of next meeting.

Secretary.

Please fill in this blank and mail to H. C. Brown, Cor. Sec'y, 185 East State St., Columbus, Ohio."

Reports were received from only about sixty per cent. of those addressed. It is to be regretted that so large a per cent. of the secretaries, through negligence or indifference, failed to furnish the information requested. The office of secretary in a dental society is a responsible position, and no member should be elected to or accept such a position unless he possesses at least some qualifications, and is willing to give his best efforts in the discharge of his duties. A secretary failing to give due consideration to a communication received from an official of a similar organization, addressed to him as the accredited official of the organization which has thus honored him, is both discourteous to a co-worker and disloyal to his fellow members.

Of the reports received, twelve voted "Yes" and three "No," upon the national proposition. Others expressed interest in the success of such an organization, but did not go definitely on record, while a few stated that they would become affiliated under specific conditions. In view of these diversified reports, and the fact that the draft submitted by the revision committee was thought by some members not to be in the best possible shape for consideration, therefore it seemed advisable to postpone this question for another year, and the following resolution was adopted:

"RESOLVED, That the Committee on Revision of the Constitution and By-Laws be continued, and that Drs. R. Ottolengui and H. C. Brown be added to the committee, and that the committee be directed to request the President, or a representative to be appointed by him, of the various state associations, the Faculties' Association, the Examiners' Association, the Dental Educational Council, and the Dental Faculties' Association of American Universities, to a conference to be called at the pleasure of the committee for the purpose of considering a Constitution and By-Laws for this association, and to report thereon at the next annual meeting."

It is the intention of this committee to faithfully carry out the instructions embodied in this resolution, and it is hoped that these representatives will be selected, first, because of their familiarity with society work in general, and, second, because they are well acquainted with the wishes of their respective organizations upon this subject. In all probability this conference will be called to meet in Cleveland, Monday morning preceding the meeting of the National Association, which is Tuesday, July 25, 1911. This will permit all state societies to officially act upon this question and select their representatives. Such a representative should know just what his society desires, but he should be given authority to act and vote in accordance with his best judgment after all phases of the question have been thoroughly canvassed. This conference being called in conjunction with the National, will naturally stimulate the attendance. It is hoped that every state society will feel its responsibility in this re-organization proposition, which is of such vital importance when considering the future of our profession, and not only select a representative, but also select an alternate who may take the place of the representative if for any reason the former cannot attend. If this conference is as representative as it should be, and a constitution and by-laws is agreed upon, it can promptly be reported to the association, and, when adopted, as it undoubtedly will be, it should meet with the full approval and receive the hearty-co-operation of the profession generally, and we should lend our individual and united efforts to the end that we may have a more representative national association and a national dental journal.

Our dental journals are, and have been, rendering most valuable assistance in our progress, and a plea for a national journal cannot, in any sense, be construed as a reflection upon the present journals; in fact, it is a recognition of the benefits derived through their effective work. Our present organizations have contributed liberally to the success of the journals, since if it was not for the various societies stimulating their members and supplying the papers presented at their meetings, the journals could not secure sufficient material or accomplish the same acknowledged results. However, the organizations and the journals are necessarily largely dependent upon each other, and when the National Association becomes what we hope that it will be in the near future, then we should have and support a national journal.

No professional organization having only selfish motives has any reasonable excuse for its existence. The first and most important purpose of such organizations, as outlined, should be that it makes possible the rendering of better service, and so educating the public that they will not only appreciate their teeth and give them more personal attention, but will accordingly appreciate our services.

In addition to this, such organizations can and do render public service through adequate legislation, by raising the entrance requirements in college and the college curriculum, which more thoroughly equips the graduate product thereof; and this, together with the advanced requirements through the state examining boards, adds another safeguard in the interest of the public. Appointment to the state examining boards should be made from recommendation of the state society, and an active state organization is usually in a position to keep up the standard of their state board. Advanced legislation has been secured in several states in the past few years, but in some their efforts have not been rewarded. Inefficient organization, professional indifference and lack of harmony plays a most important role in many of our undertakings, but none more effective than when seeking legislation.

The question of oral hygiene and dental inspection in the public schools, which is receiving so much attention at this time, can best be successfully presented by a dental society and not as individuals. As this is a question requiring official sanction, the same influences so necessary in legislation are equally essential.

We have a difficult task before us in our effort to reach the public in this educational work, and we will not assume that all are to be benefited in any specified time, since, according to our latest statistics, we find that, should we be successful in reaching the 35,000 dentists in the United States, and each was to assume responsibility for his apportionment of our population, he would necessarily meet with obstacles in securing favorable results from his allotment of nearly 3,000.

As a matter of fact, such things are impossible—that is, it is not probable that we can ever hope to effect an organization embracing the full strength of our profession, nor can we bring about a transformation of conditions which would be so far-reaching as to assume anything like the ideal, with such a cosmopolitan people as go to make up our population. However, should we—and I am frank to say we should—organize our profession so as to have sixty per cent. laboring harmoniously, then we can hope for better results.

Suppose each member of such an organization should effectively reach and secure the co-operation of twenty-five of his patients the first year; then you will readily appreciate that we would soon have an army of co-workers for future service, whose influence for good would be unlimited. If such an endless chain of educating the public to the proper consideration and care of the teeth, as relates to the physical well-being, could be assured to be the outcome of long hours and days of labor in this organization work, and this alone to be all that we could accomplish, then we could well afford to undertake the task, for we could render no more humanitarian or philanthropic service than to devote our energies to such an end.

Those fearful lest their busy hours change suddenly to days of idleness should cast off such pessimistic deductions, since the neglect in the past to observe the things to which we are directing attention has already done sufficient damage to cause no alarm from this source. In fact, the percentage of our population receiving dental service is so small that a general system of education in this particular would work greatly to increase rather than diminish the demands for such service, thus necessitating an increased profession, numerically speaking, which will naturally be regulated by the law of supply and demand.

I consider that four distinct classes are essential in conducting a successful state or national organization, as follows: Those with some business or executive qualifications for conducting the general affairs of the organization; those of a scientific trend of thought to investigate problems too deep for the vast majority; those possessing more than ordinary mechanical ability to develop and advance the practical side of our profession, and last but not least, those who attend the meetings, aid in committee work or such other duties as may be assigned to them, and encourage the other three classes to do their best work by their presence and loyal support. This last class constitutes a large majority of such members, and they are the ones receiving the greatest benefit.

I fully appreciate the fact that a paper like this is not needed by a small per cent. of our profession, unless it be to stimulate and encourage them to renewed efforts; however, there is a very large per cent. that need more than stimulation and encouragement, and it was with the hope of reaching and aiding these, together with my desire to see our profession better organized, which prompted me to present this subject, and if it contributes in any small degree to that end I will feel that it has served its purpose.

So far this paper has treated the subject generally, but I will briefly take up the conditions in West Virginia as I see them.

In the first place, you are somewhat handicapped, since you have only a limited number of dentists, and not very satisfactory transportation facilities in bringing them together for a good state meeting. This is due to the fact that most of those located any distance from the Ohio river must necessarily come to the river in order to reach some of the most prominent cities of the state. Owing to this handicap local societies are especially indicated, but I am informed that you have no such organization, except that the Wheeling dentists have recently organized a dental club, to the mutual advantage of all those associated therewith.

From information received from your secretary, it would appear that you have only about one-sixth of the profession as members of your state dental society. I am strongly impressed with the fact that the organizing of several local societies would be of great benefit to those practicing within the jurisdiction of such societies, as well as a stimulus to your state organization.

Wheeling, Parkersburg, Huntington and Charleston should organize local societies and take in the territory adjacent thereto that is, those dentists residing close enough to these cities to get the benefit of at least some of the meetings which such societies would hold. Clarksburg, Grafton, Fairmont, Morgantown, Mannington and Weston could go together and organize a very strong society and accomplish much good in this particular section of the state.

I am not sufficiently familiar with the other sections of your state to make suggestions, but would advise that the general outline, as presented in my paper, should be utilized wherever it is found to be practical.

Every task we master adds to our reserve fund of strength and spiritual force. Every task that masters us depletes our spiritual force and decreases our strength of character.

—DOROTHY QUIGLEY.

RESTORATION OF BADLY BROKEN-DOWN ROOTS WITH ACOLITE.*

By James B. Lester, D. D. S , Christianburg, Virginia.

THE saving of badly decayed roots is a thing too often neglected by the dentist. I have reference to those roots where decay has progressed far beyond the cervical portion.

In my judgment the condition of these teeth arises from one of two principal causes: first, many persons fail to realize the importance of caring for the teeth until they are badly broken down, and then they present themselves for extraction because of alveolar abscess; second, many people are too miserly to have their teeth cared for until they have lost a large number, and they realize their inability to properly masticate their food.

The first class can generally be convinced of the importance of caring for their teeth. The second are easily convinced that their teeth are important to them.

In mouths of this class of patients we often find roots that are covered with gum tissue. After the decay is removed the end of the root is beyond the cervical line, hence, in my opinion, it cannot be restored with any material that is placed there in a plastic condition, because it would be impossible to make a restoration smooth and of proper contour beyond the gum line.

Because the restoration of these roots to their normal usefulness is tedious many dentists condemn them to the forceps and replace with bridges.

In my practice if there is two-thirds or three-fourths of a root left after the decay is removed, and that portion solid, it is worth an effort to save.

When these cases present themselves for consideration my first step is to remove all decay as nearly as possible. This will generally cause hemorrhage from the wounded gum, which is stopped with adrenalin. The end of the root is thoroughly dried, and the canal or canals treated with formocresol. A piece of temporary stopping of sufficient size to fill the cavity (in gum) is thoroughly softened and made into a cone, or other appropriate shape, and forced in place so as to move the gum tissue out. The patient is dismissed to return a day or two later, and at the next sitting all decay is thoroughly removed, the canal cleansed and again treated with formocresol, and the cavity packed as before. The patient is dismissed for five or six days, and on returning the canals are sealed at the apex, if they are in proper condition; if not, this is done at a later sitting. The end of the root will generally be well defined, and you are now ready to begin the restoration.

If the root is an anterior one an all-porcelain crown with attached pin is selected that is long enough to allow the porcelain to extend beyond the gum margin, thus avoiding the possibility of a dark joint at the gum line. The pin is ground to proper length, and inlay wax that has sufficient rigidity to stand carving is chosen. (I personally prefer the Standard put up by The Ransom & Randolph Co.). A sufficient quantity of this is softened and placed around the base of the pin, so as to leave an excess. While the wax is fairly soft the crown is pressed into place and held firmly until the wax is hard. Crown and wax are now removed, the wax is trimmed to the size of the root and crown, the piece is again put in place to ascertain if the adaptation is perfect. A sprue wire is attached and the case is invested as directed for casting acolite. That process I will not describe here as it would be taking unnecessary time. After casting, the metal is polished and the work tried in to ascertain if the adaption is now perfect. If it is, the piece is set with cement, care being used to have as little excess cement as possible, as it is more or less difficult to remove excess from under the gum and any left would act as an irritant.

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*Read before the Virginia State Dental Society, 1910.

If the root is a molar, and you wish to use a gold shell crown as an abutment for a bridge, pins are arranged parallel to each other in the enlarged canals. A large piece of wax is softened, and pressed up on pins, and allowed to harden. Wax and pins are now removed, the wax is trimmed to the size of the root as shown by the impress. If the wax does not extend sufficiently above the cervical line, more wax is softened and shaped on the end of the piece already in hand. The piece is now invested and cast. By this method we have supplied a stump to which a gold shell crown is easily adjusted.

I have suggested the use of acolite in the restoration of these roots because it can be done at a much smaller cost to the patient than would be possible if gold was used, and at the same time done well.

Where molars are too badly decayed to fill with amalgam and on account of cost the patient cannot have gold inlays, this same method may be used to make Acolite inlays that will give comfortable service.

PRESSURE ANESTHESIA IN PULP EXTRACTION.*

By R. R. Gillis, Hammond, Indiana.

SOME practitioners never use pressure anesthesia in this operation; others claim to use it exclusively. Both err somewhat.

Like all other dental operations, many repetitions of the process are necessary to make a dentist able to attain real efficiency in handling cases where pressure anesthesia is indicated for pulp removal. This fact creates the two classes mentioned.

Some practitioners will endeavor to use the method, but being inexperienced or possibly because they strike a few obstinate cases—they fail to get desirable results in the beginning, become discouraged and fall back into the arsenic rut.

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*Given as a clinic at Indiana State Dental Society, 1910.

The others meet favorable cases in the beginning; early success makes them enthusiasts for the new process and their enthusiasm sometimes leads to the exclusive use of pressure anesthesia. But there is a happy medium for the use of this process, which some experience and the ever necessary "horse sense" ought to show to any practitioner.

In any case, where decay has progressed so far that its removal means exposure of the pulp, you can use pressure anesthesia satisfactorily. And in those cases where the pulp is almost exposed the method may be employed with nearly the same degree of satisfaction.

It might be made a rule that your degree of ease and success in the use of pressure anesthesia is in proportion to the degree of the advancement of decay toward the pulp. However no rules--only experience—can teach us how and when to proceed with this method. Briefly, this outline of procedure will apply to most cases:

Remove the frail overhanging walls of enamel to gain as free access to the cavity as is possible without cutting into the dentine.

Next, with sharp spoon or battleax excavators lift up and peel out the leathery layers of decay. When skillfully managed, this part of the operation is almost painless. Remember always to exert your force in a direction away from the point of probable exposure and avoid also pressure in the lines of junction between enamel and dentine.

Often an actual exposure is made painlessly in this process. If not and further excavating causes unnecessary torture to the patient, make the exposure with a small, sharp, rapidly revolving bur. That sentence may sound like torture, but the pain caused is only for a second and even the most nervous patients will stand it bravely, if forewarned.

Making the exposure probably starts a flow of blood which is a good thing, especially if your case is a badly congested pulp or one where a trace of pus is already present and decomposition about to take place.

Next cleanse the cavity with warm water or hydrogen-peroxid and dry it with cotton. Then place the cocain solution in the cavity followed with a piece of unvulcanized rubber of size suited to the cavity; forewarn the patient that a moment's sharp pain will be felt, then proceed to make pressure toward the exposure with any suitable instrument, probably a broad-ended amalgam plugger.

Operators differ as to the form of cocain to use. I have never had better results than with the use of the little pellets of pure cocain hydrochlorate put up by several firms of manufacturing chemists. In this form the cocain is easy to handle, you know exactly how much you are using (each pellet contains 1-12 grain and one-half of a pellet or 1-24 grain is sufficient for most cases) and you can place it exactly where it is wanted, right over the exposure.

For some time I tried moistening the cavity then carrying the cocain pellet with pliers into the cavity; then I tried carrying the pellet of cocain with a moistened pellet of cotton; but the best method of all is to dry the cavity walls with cotton; with a flat-bladed instrument like a battleax No. 19 excavator dipped into water and thus carrying a small drop, touch the cocain pellet and the moisture will enable one to thus pick up the pellet and carry and place it exactly where wanted.

When the pulp is cocainized, the pulp chamber may be opened wide so as to gain free access to each canal and the pulp removed at once.

POINTS OF INTEREST FOR THE BUSY DENTIST.*

By W. H. Upjohn, D. D. S., Lafayette, Indiana.

WHEN busy at the chair the dentist does not have much time for the laboratory. In consequence, he must take a short cut to complete what he does do, and do it well, if there is but a short time in which to complete the work for the patient, otherwise, he can send same to the laboratory expert, who likewise can be benefited by this clinic given.

The points to be brought out are as follows:

(1) A thin solution of red vulcanite rubber dissolved in carbon disulphide. (Do not use any chloroform or gasoline in connection with this solution, but the carbon disulphide instead.) The above solution makes a perfect rubber cement within itself.

(2) In packing a full or partial set of teeth, after the wax is scalded from mold, paint all over with the rubber cement, where you will want to pack the vulcanite rubber. This will retain the rubber where packed, without warming the molds. This is a time-saver over the old way of heating the molds, with the risk of overheating and blowing up the same. Do not apply the rubber cement on a hot mold for it is very volatile and burns on too hot a surface. It will work on a cold mold as well as on a warm one. The rubber cement causes a closer union between the teeth and the vulcanite when used. In applying this cement use a mucilage brush or a small stiff brush which is kept in the bottle of cement, well corked, with a snap or string over the cork to keep it from being forced out, and letting the carbon disulphide evaporate.

(3) The rubber cement is a great time-saver in vulcanite repair work. Take a cracked or broken plate, mount on plaster, and after hardened, remove the plate and cut the broken edges at 45 degrees with a Hall abrasive wheel or a file. Then place back on model; paint with the cement, cut the amount of rubber needed for the occasion, and warm over dry heat until well warmed through, holding the parts of the old plate with one hand, and pressing the new rubber into place firmly with the finger or thumb of the other, then with a sharp or thin instrument, well heated, trim the rubber down to the thickness and form desired. Then invest in the flask, and immediately screw together, and as soon as plaster is hard enough for vul-

Given as a clinic at Indiana State Dental Society, 1910.

canizing, proceed to vulcanize. You will find that the repaired plate will come out first-class with a perfect union of the old and new rubbers, without the slightest effort to undercut, which is unnecessary. Pink rubber can be used in connection with the red rubber cement without showing but very little, if any. To clean the old rubber and teeth, use the carbon disulphide, and not chloroform or gasoline.

To replace a very much broken up old plate, wax same together, build up, or make any changes desired, with wax, on the old plate. Invest the same as when teeth are set up on wax. Place in the vulcanizer and run up to the vulcanizing point, then immediately let out the steam and proceed to open up the flask, and pull out the old rubber quickly from the old teeth. (Do all this with leather gloves on, so as not to burn the hands.) If any of the teeth are displaced by removing the old rubber, they can be replaced the same as when using wax. From this point on, proceed the same as when packing a new set of teeth.

AMALGAM BASE FOR GOLD INLAYS*

By Steele F. Gilmore, D. D. S., Indianapolis, Ind.

IN deep lying approximal cavities that are inaccessible (such as are distal cavities in molars and bicuspids) rendering the adaptation of the wax model and its gold replica to the cervical border uncertain, resulting in secondary or recurrent decay at this point, this method is indicated.

Technic: After the preliminary opening of the cavity in a gross way, apply the Ivory band matrix, and with it in place excavate the cavity floor with right angle burs. The matrix acting as a guide to your instruments prevents them from slipping into the soft parts, causing unnecessary pain and irreparable damage to the delicate tissues occupying the interdental space. If you are satisfied with the preparation of the cavity floor, together with its buccal and lingual walls, remove the matrix and carefully stone the margins. Now if the approximal surface of the neck of the tooth is irregular concave for instance) you can, with pliers, so swage and manipulate this soft steel as to adapt it accurately to the surface above mentioned. Properly mixed amalgam, in *very* small pellets, may now be vigorously burnished in and built up as far as your judgment may dictate. Insert temporary stopping until the next sitting, when complete preparation of the occlusal surface can be made. Or a quick setting amalgam may be used and the model obtained at the first setting.

Advantage: A perfect adaptation, without any of the elements of guess work in this dark corner. The surface alignment of your filling is automatically provided for at the cervical margin. To the delight of the patient, approximal trimmers and burnishers are not needed. You have re-inforced the weak point of all inlays. There can be no electrical disturbance, since the two metals are insulated by the intervening cement.

Given as a clinic at Indiana State Dental Society, 1910.

A SHORT CUT TO REPAIR RUBBER BY THE INLAY PROCESS.*

By F. A. McAulay, D. D. S., Cleveland, Ohio.

In vulcanizing, where the red rubber squeezes through the pink, you drill out the red rubber, making square edges and slightly undercutting to retain the inlay. You now take a piece of vulcanized pink and dress to just fit the place drilled, heat over the Bunsen flame till the pink plug becomes soft, then press into plate and cool off with water, cut off and finish. It can't be detected when neatly done. Care should be exercised not to burn the inlay for if you do it will leave a dark circle around the edges. I am indebted to an article in THE SUMMARY written by Dr. M. B. Lansing, of Iowa.

GOLD FILLING IN DEEP SEATED CAVITIES.*

By Dr. E. L. Patchin, Cleveland, Ohio.

The following method of making a gold filling in deep-seated cavities with thin or discolored walls has given me good results:

Take a white quick-setting cement ground fine (and must be sticky) I have been using the Ames inlay liquid A, but there are others that are good; dry out your cavity with warm air, make your mix a thick cream. Take your smooth broach in a handle and pick up a small quantity and cover the floor of the cavity evenly, leaving the under cuts about half full. Take a leaf of corrugated gold No. 4, cut it so each leaf will make three folded lengths. I say corrugated because the corrugation holds it in cement from pulling laterally. Cut your gold into small flat pieces, heat it and put in flat side down, carrying it under the undercuts until there are two layers over the cement. I use a small serrated plugger for each layer. By the time you have this done your cement should be hard; put on your mallet and finish. There should be no cement near the margins. Labial cavities need no undercuts, the stress of the plugger point on the porous and elastic dentine is lessened in this method. It retards decay, especially in the rapid varieties.

ANOTHER SUGGESTION

A lady in the twenties came into my office about three years ago, saying she wished advice about an upper left lateral that had gone astray. I found it lodged against the lingual surface of the first bicuspid; it was down, but probably fused with the root of the bicuspid. As her front teeth were short and sound, and a bad case to bridge, I proposed to crown the lateral and put a quarter cap upon the lingual part of the bicuspid, using the lingual surface of the cuspid and central to steady the extension to this. I added a porcelain tooth to fill the space, depending upon the gold platinum iridium support. She has worn this three years and says she has become so used to it she does not want it otherwise.

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*Given as a clinic at the Northern Ohio Dental Society, 1910.

OBTUNDING SENSITIVE DENTINE.*

By C. E. White, D. D. S., Indianapolis, Ind.

Apply rubber dam, dehydrate with alcohol and warm air, then apply 50% solution of aromatic sulphuric acid on pledget of cotton, dry cavity with blast of warm air, repeat same till cavity can be excavated without pain. The alcohol and acid should be warmed.

FILLING TEETH WITH SOFT FOIL, TIN AND TINGOLD.*

By C. A. Barnhill, D. D. S., Indianapolis, Ind.

Prepare the cavity as for any gold filling and use foil in cylinders or mats, making cylinders slightly longer than the depth of cavity, to allow for condensation. Begin by filling all the margins of cavity, then secure it by keying it with a center plug or wedge; force all cylinders to place and condense by burnishing and malleting.

Cohesive filling taking an hour for insertion can be put in in this manner in from ten to fifteen minutes and to my notion making a better filling on account of the adaptability of the soft foil to the margins of the cavity.

TO MAKE AN UPPER VULCANITE PLATE FIT TIGHTER AFTER HAVING BEEN REPAIRED.*

By S. W. Shields, Brownstown, Ind.

When an upper vulcanite plate is broken, assemble parts, fill the plate with plaster as you would an impression. When the plaster has set pass it over a spirit lamp a few times. This will cause plaster to sweat, making it easy to remove the broken plate. Now select a rounded end instrument about the size of a No. 13 gauge wire. With it cut a groove one-half as deep as the gauge, all around the cast at the edge where the plate comes. Then proceed as in your usual way to make repairs. After the plate has been placed back on cast and vulcanized a half round bead will be formed all around the plate by the expansion of the old vulcanite.

PRACTICAL SUGGESTIONS.

By J. R. Hull, D. D. S., Leesburg, Ohio.

To make cotton adhere to a smooth broach: When treating root canals with Dioxogen try dipping the broach in sandarac varnish before twisting the cotton on same.

When taking impressions with plaster of Paris add a few drops of Sanitol liquid, or other similarly flavored liquid, to water before adding the plaster, especially a nausea patient. See how much more pleasant it will be.

Given as a clinic at Indiana State Dental Society, 1910.

EDITORIAL

COMPARATIVE EFFICIENCY OF SOME COMMON GERMICIDES.

THERE HAVE been so many conflicting statements as to the real efficiency of germicides, especially those in common use for treatment of pathological conditions and instrument and hand disinfection, that the average professional man uses the solution not with a feeling of assurance, but rather of doubt, and trusts to good fortune for satisfactory results.

Bichlorid of mercury has been looked upon as a sort of standard with which other germicides are compared, but from recent tests by Drs. Post and Nicoll*, of Chicago, it is shown that bichlorid is not as effective in a one, ten, or thirty-minute exposure, even in as strong a solution as 1-500, as a number of the common germicides, iodin, phenol, trikresol, alcohol, etc.

The tests were thoroughly conducted and necessitated nearly 2,000 inoculations.

The media employed was blood-agar and the pathogenic germs used were streptococci, pneumococci, gonococci and typhoid bacilli.

Bichlorid solutions were found to be slow in their action. Organisms immersed in a 1 to 500 solution were still living in large numbers at the end of ten minutes and one colony of gonococcus was obtained after thirty minutes' exposure. In a 1-2000 solution there was no apparent effect in thirty minutes, but after twenty hours there was complete disinfection. These findings prompted the investigators to say that "contrary to a prevalent opinion the solutions of bichlorid of mercury are absolutely ineffective where prompt disinfection is required, as in the disinfection of hands and fields of operation."

Silver nitrate, even in a 1-5000 dilution was found more effective than a 50 per cent. solution of argyrol or a 10 per cent. solution of protargol.

In the phenol preparations tested Kreso and Trikresol in a 1 per cent. solution killed all organisms in less than one minute. Creolin in 1 per cent. solution and Lysol in 1.5 per cent. were less effective, as was phenol in a less than 5 per cent. solution. A 5 per cent. solution of phenol, however, killed all organisms in less than one minute.

The solutions of Iodin were surprisingly effective. Senn's solution: I 1 part, KI 1 part and aqua 100 parts, and the same with 400 parts of water, and the tincture of Iodin, each killed all organisms in less than one minute.

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*Jour. Amer. Med. Asso., Nov. 5, 1910.

Liquor Formaldehydi gave unexpected results on account of its slowness of action in solution as strong as 1 per cent., which did not completely kill the germs in thirty minutes.

And a 2 per cent. formalin in glycerin acted more slowly than 1 per cent. in aqueous solution.

Thiersch's solution proves to be a fairly good germicide.

Potassium permanganate was only mildly active in the dilutions used, but even a 1-4000 solution killed the organisms fully as rapidly as a 50 per cent. solution of argyrol.

Cupric sulphate showed a distinct effect after thirty minutes, and killed entirely in less than twenty hours.

Boric acid in saturated solution was only slightly germicidal after twenty hours.

Glycerin showed almost no germicidal power.

On the other hand, alcohol proved to be surprisingly effective. A 20 per cent. solution killed all gonococci in less than ten minutes. With exception of one single colony of pneumococcus, cultures from 30 per cent. alcohol were entirely negative after thirty minutes. Alcohol in 50 per cent. and 70 per cent. solution killed all organisms in less than one minute.

The tincture of green soap showed a high germicidal power, killing all organisms in less than one minute.

This is important to dentists for hand and instrument cleansing and disinfection is a subject all are interested in.

In this connection I might add that Dr. H. Selter in *Deut. Med. Wochensch* states that the use of alcohol is the most appropriate means of rational disinfection of the hands. Its efficiency can be increased by combining alcohol with soap, whereby it is enabled to penetrate into the deeper cutaneous layers and destroy bacteria present there. A suitable alcoholic paste can be made by mixing 86 parts of absolute alcohol and 14 parts of soap. The paste is rubbed into the skin of the hands in amounts of five grams for about five minutes.

PURPOSE IN LIFE

EVERYONE, if he desires to amount to anything, even to himself, should have an aim. A person must try to be something in the world or he will be nothing. Nor must this purpose be a dream of youth, to be dropped when one beomes of age, or middle age or even old age—when one drops his purpose he loses his hold.

Of course, these aims change as a person grows older, and they stretch out from boundless ambitions and heights of endeavor, to the tender experiences of one single day. But through all these forms of ambition is the purpose running that forms personality; that gives character and trend to the individuality.

Purpose is a determination to be something; to have a word or a hand in the helping along of right things.

This help may amount to only a kind word, a pat on the back, a gentle courtesy, or any other simple act of goodness that is encouraging and helpful and makes a just cause stronger.

A person doesn't have to be president or governor or command armies to carry out a noble purpose in the world.

The opposite of purpose is indifference, carelessness, recklessness, a piece of driftwood on the waves going nowhere. A sad fate indeed for anyone who puts a proper estimate upon his honor and dignity of human life.

Be something better than nothing. Don't be the driftwood and go about aimlessly, getting nowhere. Get into your boat Purpose, stir your ambition, ply the oars with a steady stroke and determination, guide the boat with a cool head and it will carry you from port to port as you will.

TO MEMBERS OF OHIO STATE DENTAL SOCIETY

At the recent Convention, arrangements were made by which THE DENTAL SUMMARY becomes in fact, and in all that the term implies, the Official Organ of your great Society. THE SUMMARY is now, more completely than ever before, YOUR magazine.

Official notices, announcements, communications of all kinds from your officers will be made through its pages; reports of the State Society and of its components are to appear exclusively in it; proceedings of your state and district conventions are to be printed in THE SUMMARY and are to be printed and distributed in no other way.

Every member of the State Society is to receive THE SUMMARY regularly while he remains in good standing; and all such subscriptions are paid for out of the funds of the State Society.

Members of the State Society who have subscribed and paid in advance for the year 1911, will be credited for the amount paid, and the subscription charged to the State Society.

Members of the State Society, knowing themselves to be in good standing, who do not receive the January numbers or succeeding numbers, should at once communicate with the Secretary, Dr. F. R. Chapman, 305 Schultz Building, Columbus, Ohio, advising him of the facts. If such advices are sent to this office, they must be referred to the Secretary; therefore, time and unnecessary correspondence will be saved by sending them direct to the Secretary, as suggested.

There is no road to success but through a clear, strong purpose —nothing can take its place. A purpose underlies character, culture, position, attainment of every sort.—T. T. Munger.

SOCIETY·ANNOUNCEMENTS

Officers National Dental Association, 1910-11

The list of officers of the National Dental Association is as follows:
President—Dr. E. S. Gaylord, New Haven, Conn.
Vice-president for the East—Dr. C. S. Butler, Buffalo, N. Y.
Vice-president for the South—Dr. J. W. David, Corsicana, Texas.
Vice-president for the West—Dr. E. R. Warner, Denver, Colo.
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Recording Sec'y—Dr. H. C. Brown, Columbus, Ohio.
Treasurer—Dr. Arthur R. Melendy, Knoxville, Tenn.

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Federation Dentaire Internationale Delegates—Burton Lee Thorpe, St. Louis, Mo.

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And the Chairman of Sub-Committees as follows—Publicity and Transportation—G. D. Lovett, 761 Rose Bldg.

Finance—D. H. Ziegler, 716 Rose Bldg.

Exhibits—S. M. Weaver, 726 Rose Bldg.

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Hotels and Assembly Hall—H. C. Kenyon, 730 Rose Bldg.

Reception—J. T. Newton, 1315 New England Bldg.

The next annual meeting will be held in Cleveland, Ohio, July 25-26-27-28, 1911.

Ohio State Dental Society

AT the meeting of the Ohio State Dental Society, held Dec. 6-7-8, 1910, the following officers were elected:

President, A. O. Ross, Columbus; first vice president, C. R. Converse, Springfield; second vice president, W. A. Price, Cleveland; secretary, F. R. Chapman, Columbus; treasurer, S. D. Ruggles, Portsmouth. Directors for three years, J. F. Stephan, C. R. Butler, M. H. Fletcher, L. E. Custer. L. L. Barber was elected to fill the unexpired term of W. H. Todd, deceased.

The following resolution, offered by H. C. Brown, was passed:

Whereas, There is now pending before Congress a bill providing for a Public Bureau of Health, Therefore be it

Resolved, That the Ohio State Dental Society in session December 6, 7 and 8, 1910, endorses this bill and requests the profession of the state generally to use such influence as they may have with our senators and congressmen in securing this much-needed legislation, and be it further

Resolved, That the Secretary forward a copy of this resolution to Senator Robert L. Owens, the author of the bill, and to the committee to which this bill has been referred.

G. V. Black Dental Club

The G. V. Black Dental Club, of St. Paul, Minn., will hold a midwinter clinic in St. Paul, on Feb. 16-17, 1911.

A very interesting program is being arranged. Operations will be made and papers read by prominent members of the profession. Full program will be published later. The profession generally is invited to attend this meeting.

Members of the profession having anything new to offer for our consideration are most cordially invited to be present and show same. Drs. G. V. Black and C. N. Johnson, of Chicago, will be in attendance and take part in this meeting.

For further information address R. B. Wilson, Secy., Am. Nat. Bank Bldg., St. Paul, Minn.

Resolution Passed by the National Dental Association

Resolved, That it is the conviction of the National Dental Association that the Metric System shall become the accepted standard of weights and measures in all professional and commercial transactions.

To accomplish this purpose at as early a date as may be practicable it is urged that all physicians, dentists, druggists and dealers in precious metals be urged to put into practice this system of weights and measures at once.

It is further resolved, That this resolution be published with the proceedings of the society and a copy sent to all the dental journals and to the Secretary of the U. S. Pharmaceutical Convention, Dr. Murray Galt Motter, 1841 Summit Place, Washington, D. C.

Indiana State Board of Dental Examiners

The Indiana State Board of Dental Examiners will hold its next regular session at the State House in Indianapolis, beginning Monday, January 9th, 1911, and continuing four days.

At this meeting all applicants for registration in this State will be examined. No other meeting will be held until June. For further examination address the Secretary, F. R. Henshaw, 507-8 Pythian Bldg., Indianapolis.

THE DENTAL SUMMARY

The Magazine That Helps

Vol. XXXI FEBRUARY, 1911 No. 2

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The Indiana State Dental Society
The Kentucky State Dental Society
The Louisiana State Dental Society
The West Virginia State Dental Society
The Northern Ohio Dental Society
The Northern Indiana Dental Association
The Eastern Indiana Dental Society
The Southwestern Michigan Dental Society
Odontological Society of Western Pennsylvania
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L. P. Bethel, M. D., D. D. S., Editor-in-Chief

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REGULAR CONTRIBUTIONS

THE PREVENTION AND TREATMENT OF ROOT CANAL INFECTIONS AND ASSOCIATED LESIONS.*

By Don. M. Graham, M. D., D. D. S., Detroit, Mich.

IT is safe to say that a very large percentage of root canal infections and associated inflammations are entirely and easily preventable. Septic pulpitis, as well as septic apical pericementitis, is most frequently preceded by symptoms which, if heeded and properly interpreted, will allow of early and appropriate remedial measures that can be depended upon to prevent much unnecessary suffering, as well as prevent inevitable tissue destruction.

When we remember that the great majority of abscesses, necroses, fistulae, as well as a great many antral empyemas, are the result of root canal infections, it would seem reasonable that the question of prevention should receive our first and most careful consideration. It is impossible to enumerate and discuss all, or even the majority of prophylactic measures that can be profitably employed, but if we are to render our patients the best possible service, it is certain that we must insist on frequent visits, that the first evidence of the pathologic may be detected and corrected.

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*Read before the Michigan State Dental Association, 1910.

Malocclusions and all forms of pericementitis should receive our intelligent and thoughtful attention. All evidences of thermal stimulation should be inquired into, as well as all abnormal sensations, that early treatment may be instituted and subsequent troubles thereby averted.

A systematic and careful search should be made for caries, and when found these cavities should be filled. Perhaps there is no more pernicious habit, and one which we are all prone sometimes to follow, than is that of allowing a cavity to get a little larger before repair is attempted. Many pulps have been needlessly sacrificed from this practice and many abscesses and necroses have followed from this neglect.

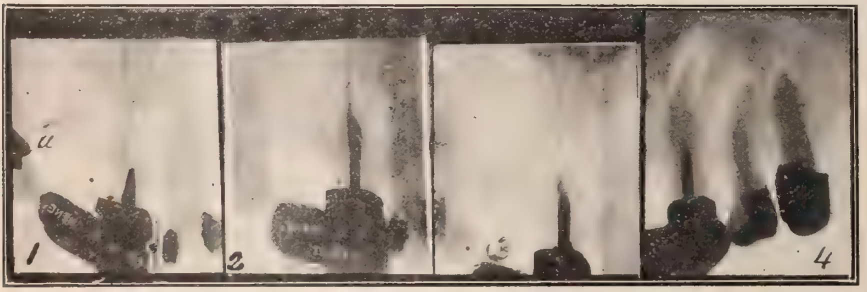

Fig. 1. Central showing improperly filled canal. a, flexible probe showing direction and opening of fistulous tract.

Fig. 2 shows canal reclaimed and filled to overflowing.

Fig. 3 the same with root amputated.

Fig. 4 shows abscess caused by improper canal filling, shows also pyorrheal condition.

When cavities are found it is the belief of the writer that it is almost malpractice to restore the tooth with a metallic filling without an intermediate non-conductor. That many cavities have been filled and can be filled successfully with metallic contact is not denied, but there is so much to be gained by such a procedure that it would seem the part of wisdom to make this the invariable rule. With shallow cavities, a quick-setting oxyphosphate or oxychloride of zinc mixed to moderate stiffness is all that is necessary. With the deeper cavities the pulpal walls should first be painted with some non-conducting varnish, or chloropercha and iodoform. With a trained assistant, the routine practice of lining all cavities will consume probably about one additional minute per filling. By this method we have also the great advantage of hermetically sealing the cavity, as well as preventing sudden thermal changes. Large inlays should always be cast hollow when prepared for vital teeth, for the same reason.

When any doubts are entertained as to the future welfare of the pulp of posterior teeth, it is safer to devitalize. Teeth that have to withstand unusual stress in carrying bridges, especially if bell-shaped, are much safer devitalized. Teeth in an advanced stage of pyorrhoea should also be devitalized, as well as treated along approved prophylactic methods, if we are to do efficient preventive work.

Faulty cementation of dowels and shell crowns is another source of infection. In a highly dehydrated canal it is most difficult and sometimes impossible to perfectly cement a dowel, as the cement rolls upon itself and withdraws with the canal filler, leaving air spaces. With a canal somewhat moist, a cement of proper consistency can be painted on the walls and forced to every part of it. The dowel should next be carefully smeared before cementing into place. It not infrequently happens that in an abscessed root carrying a porcelain crown of recent construction, a fine broach can be forced to the apex after the crown has been removed. This would be impossible with proper cementation, which insures permanency of dowel, as well as exclusion of oral infection. Even with well fitting shell crowns the best results are gotten by having the tooth not too dry and painting it also with cement, which will form a union with the cement in the shell.

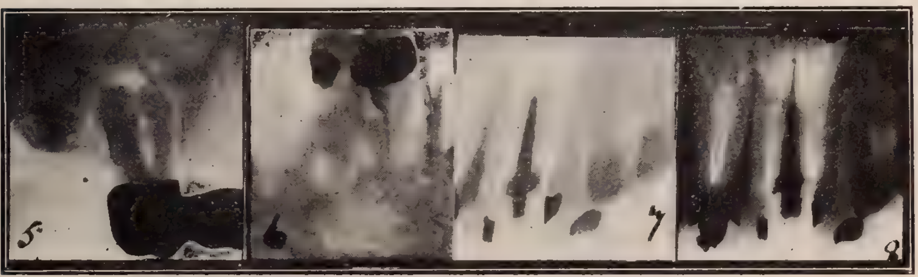

Fig. 5 shows an apical abscess which caused an antral empyema.

Fig. 6, apical bicuspid abscess, improperly filled cuspid canal and a tortuous lateral with abscess which would not yield to treatment because apex could not be reached. Note wire in canal.

Fig. 7 shows a properly filled central, but the canal of the lateral is not filled to apex, hence the abscess. Fistulous opening was over central in this case.

Fig. 8. Lateral canal filled, also shows what generally happens on canal point where we have a large apical foramen.

Many other preventive measures might here be mentioned, but the filling of teeth without due regard for the integrity of the pulp, or the filling of pulpless teeth without proper removal of canal contents and its replacement with a suitable canal filling, is undoubtedly responsible for most of the alveolar abscesses.

Devitalization of pulp and its replacement by a suitable canal filling is a sure and certain method of preventing many infections. It is not within the province of this paper to discuss methods of pulp extirpation; suffice it to say that whatever method is employed, it should be pursued with a due regard for the dangers that attend its use. No method is free from danger, and undoubtedly arsenic trioxide and cocain hydrochlorate each have their limitations as well as their advantages.

The canals that will give us the most trouble are undoubtedly the constricted, tortuous ones, and these are found mostly in buccal upper molar roots and mesial lower molar roots, while secondary dentine and pulp nodules and other abnormalities will increase the difficulty of the work, no matter in what tooth these may be found.

The pulp thoroughly devitalized or desensitized, we are prepared to extirpate it. Sufficient tooth substance should be removed to permit a broach to enter in a line with the root canal. It is worse than folly to attempt, as is so often done, the removal of mesial pulp filaments through a distal approximal cavity or a small occlusal opening. A good rule to follow in the removal of filaments in small canals is to open sufficiently until the entrance to that canal can be seen. Tooth substance can always be replaced by an indestructible material.

It is often impossible in these constricted canals to pass to the apex the finest barbed broach, and to persist in its use is an extremely hazardous undertaking. It is much safer and better to proceed with fine, straight broaches, which can be made by cutting the barbed portions off our ordinary ones. By bending at a short angle, considerable force can be applied and entrance gained, when progress can be made by carefully working into the canal. If there yet remains live filaments, phenol or phenol and cocain can be employed to good advantage, and as distance is gained, other broaches of longer angle and larger diameter may be used. By persistent and intelligent effort, very few indeed are the roots whose apices cannot be reached, and right here we might add that very indifferent results are to be expected of the practitioner who fails to demand a fair remuneration for this expenditure of time and effort. If the canals are difficult of entrance, sulphuric acid can be used to dissolve the organic matter. Spiral twist hand broaches can be used to enlarge, as can also a good quality of barbed broach. It is an exceedingly dangerous practice to use any form of engine reamer in these small roots, for the hand piece unavoidably obstructs the view, with the result that many roots are perforated. With our best efforts, some canals are anatomically impossible of complete cleansing, while we have sometimes the misfortune of breaking a broach, which prevents further advance. Then we are compelled to make the best of an unfortunate situation, and one on which there seems to be no agreement. Some will use mummifying material, some a strong antiseptic with the hope of preventing future trouble. It is most fortunate in these constricted and tortuous canals that if any considerable length be recovered they will remain quiescent. They should, nevertheless, be treated expectantly and so recorded, that later, if trouble arise, the root can be amputated if it be deemed advisable. Great care should be exercised in the treatment of gangrenous or abscessed pulps lest toxins or infections be forced into apical tissues. It not infrequently happens that in multi-rooted teeth we have a gangrenous or putrescent condition in one canal while in another we have a live filament. Caution is demanded here, as in all septic conditions, in neutralizing these products, when the vital canal can be treated as if it were in a single-rooted tooth. With canal sufficiently large and aseptic, we are prepared for our root canal fillings.

If we are to consider a successfully filled root canal, one that is permanently and hermetically sealed at its apical foramen, without any impingement on apical tissues, we would doubtless find very few perfectly filled canals, as it is almost mechanically impossible to always, or even generally, fill to the apex only. It is also a question if it is possible with the materials at hand to hermetically fill a canal, even outside of the mouth. But nature is ever kind and co-operative in her efforts if we do not ask too much of her. The apical tissues, we know from experience, will take care of considerable effusion, and not a little infection, if the body forces are in good repair. This co-operation and tolerance has led to the exploiting of all kinds of short-cut root canal treatments. Mummifying pastes, medicated cottons and powders, paraffin, etc., have been used, and because teeth so treated have remained fairly comfortable for varying lengths of time, their merits have been lauded to the skies. The fact is, the majority of teeth will remain comfortable for varying lengths of time with "any old thing" as a root canal filling. That mummifying

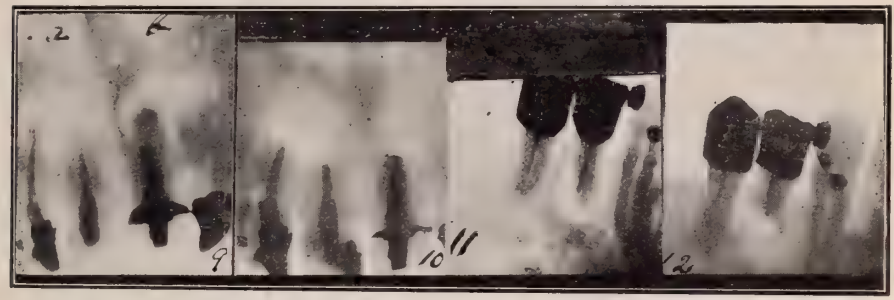

Fig. 9 shows large areas of liquefaction over centrals and lateral. Note that canals of centrals are imperfectly filled while gutta percha point protrudes at lateral apical foramen. a and b show nasal fossae.

Fig. 10. Roots of same filled and amputated.

Fig. 11 shows large apical abscess about lower bicuspid, which is in an almost hopeless condition, but patient insisted on saving it.

Fig. 12 shows the amputation of the same tooth which is now giving good service.

pastes are scientifically wrong will be conceded, I believe, by all careful investigators. The shrinkage of nerve filaments will permit of effusions from apical tissues and infection from intrinsic or extrinsic sources. The larger the canals the more room for infection, and happily the smaller and most difficult ones to fill are the least liable to give after trouble. Besides, recurrence of decay into pulpal chamber would result in dilution and disintegration of the mummifying agents, and permit easy access of infective products. Medicated powders and cottons can never be more than temporary treatments for root canals, as the drugs must necessarily dissipate themselves in time, and the apical fluids will dilute and disintegrate these materials, leaving a vulnerable zone for infection. Paraffin, in contact with tissue fluids, becomes softened and absorbed, so that it would appear that there has been no distinct advance in recent years in the matter of root canal materials.

A root canal filling, in order to be serviceable, must be non-irritating and non-absorbable. It should also be capable of easy insertion and removal. Gutta percha possesses in a high degree all these qualities. Dissolved in chloroform or eucalyptol, it can be comparatively easily inserted, and by the same drugs, its removal is not difficult if occasion demands it. It can be said to be non-absorbable, and although not by any means non-irritating, the tissues tolerate it fairly well; sometimes even when a small piece extrudes beyond the foramen. Too much, however, has been said in its favor in this regard.

Moistening the canal with eucalyptol and menthol, chloropercha, into which some iodoform has been incorporated, can be pumped into the canal with a suitable canal probe. The gutta percha point which has been dipped in alcohol can follow and be pressed home. While it is true that some of these canals, even with the greatest care, cannot be filled completely or perfectly, yet with few exceptions they can be filled so completely that any inequalities will be taken care of by the tissues, and we can feel reasonably sure of a useful and comfortable tooth if these precautions are taken.

As has been stated, the cases that give us the greatest trouble are the ones that present with putrescent or abscessed conditions. Until very recently the putrescent canal gave us much cause for alarm, but with the advance in dental therapeutics in recent years we can with complacency view the uncomplicated putrescent tooth. With the formocresol treatment we can generally put the putrescent canal in an aseptic condition in as short a time and with as little effort as we can devitalize and remove the nerve filament from a healthy tooth. Of course, great care must be exercised in dealing with putrescent conditions, as well as with the formocresol mixture. The pulp chamber must be carefully opened, and without disturbing the canal contents, a treatment of formocresol sealed into it. This is allowed to remain for a few days. On the second visit the canal contents can be carefully removed and another treatment sealed into it. In the majority of cases three or four treatments will put the canal in an aseptic condition and ready to receive the canal filling.

Where the infection has already invaded the apical tissues we have quite a different problem to solve. With these tissues in the first stage of inflammation, that is, where we have inflammatory products, but as yet no pus, our treatment should be sedative and abortive. Opening into pulp chamber and permitting the escape of gases, blood or pus, will do much in relieving pain and aborting the inflammatory condition of apical tissues. An anodyne treatment to a highly congested pulp for twenty-four hours will permit of its successful devitalization by arsenic. Counter irritants in the form of tr. iodine or tr. aconite and iodine will be found useful. If resolution is to take place, the pain will subside and the tooth can be treated, as for uncomplicated pulpitis. If, however, resolution does not take place, and the pericementum and peridental tissues become involved, we have a situation which is most trying for the patient as well as the operator. Many of us will hesitate, in the presence of a septic canal, to attempt to reach the infected apical zone with a broach, yet, since we have already infection here, it is generally best to gain access to the pus sac and evacuate its contents, if possible, into canal. The abortive treatment should still be kept up with the idea of relieving pain. Counter-irritants in the form of tr. iodine, hot water or capsicum plasters can be used to hasten its termination, if we cannot relieve the pain. If the pain still persists, Dover's powders, magnesium sulphate and even morphine may be administered, or we may anticipate the natural evacuation of the inflammatory products by making an artificial fistula after locating, as accurately as we can, the infected area and direction of the pus. When any considerable area of the apical tissues have become liquefied, it is generally best to curette, that granulation may readily and safely begin. With the evacuation of the pus and the subsidence of the pain, the canal

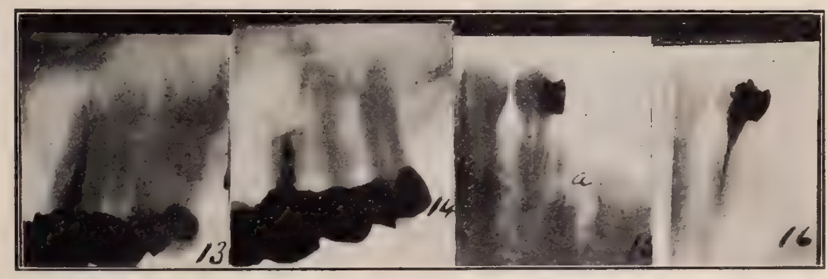

Fig. 13 shows improperly filled cuspid root with large apical abscess.
Fig. 14. Amputation of the same.
Fig. 15 shows an exostosed bicuspid root; also putrescent first bicuspid.
Fig. 16. Removal of root, also imperfect canal filling after five hours' work.

should be put in an aseptic condition and filled as soon as possible. In cases of acute apical pericemental abscesses, amputations are rarely demanded, but in chronic cases where the inflammatory products have liquefied the apical zone, leaving a considerable length of denuded resorbed root, the only scientific procedure is early and thorough amputation into healthy tissue, when healthy granulations will effectually repair the damage under appropriate after-treatment. In multi-rooted teeth one root can be sacrificed, when the tooth can be expected to give good service for a number of years.

Mesial roots of lower molars are sometimes beyond redemption, and often with so large a perforation in the bifurcation that we are tempted to sacrifice the whole tooth. If the distal root be in a healthy condition, the mesial root can be extracted and a useful crown constructed for the remaining one, which will render good service for a great many years. Sometimes the mesial root can be made to do service in like manner.

Perforation of roots are not pleasant things to contemplate, yet these can often be restored to usefulness if we give them the same care and consideration we apply to some other branches of our work. It is the custom of many to repair these perforations with gutta percha, but it has been the experience of the writer that gutta percha is by no means non-irritating, and he has found amalgam to be superior in these cases. Copper amalgam can be used and inserted by suitable instrument, after apical part of canal has been filled and pericemental tissue pressed out of cavity. An ordinary quick-setting amalgam, made rather plastic and pressed in position with suitable instrument, seems to give better results. When possible, it is advisable to first place a strip of tin, to be followed by the amalgam. This seems to permit of a smoother surface, and is therefore less irritating to the tissues. Tin alone can sometimes be used to good advantage.

The vast majority of alveolar fistulae are the results of infected root canals which, when made aseptic and filled, will permit healthy granulations to repair the damage. The injection of phenol in cases of tardy repair is generally followed by happy results. When they present on the face, they are most disconcerting, especially if we have had the patient under treatment before the abscess presented in this position. With all kindness, it can be said that physicians are responsible for most of the latter. Many physicians still advise hot applications to the face in case of pain and swelling in the alveolar region, and when evidences of pus in these tissues do occur, it seems to be most difficult for some of them to resist the temptation of evacuating it externally. We need not go far to seek the reason for this. Most abscesses with which the physician is familiar, are self-limited, and will heal spontaneously if only the pus be evacuated. Alveolar abscesses, on the contrary, will continue to infect and destroy the re-formed granulation tissue. Until this focus of infection be obliterated by proper treatment, we shall have a fistula which defies all attempts at treatment save that of root canal sterilization and filling, when the unmolested granulation cells will soon obliterate the fistula.

When such a fistula has been of long standing, we have quite a disfigurement, which may well claim our earnest attention from a cosmetic standpoint. By dissecting out the fibrous tract and bringing the fresh edges of the wound into proximity with each other by means of approximation and retention sutures, the effacement of the disfiguring scar can generally be accomplished to the satisfaction of patient and operator. With very old scars which have much fibrous tissue we can hope only to ameliorate this condition, and, in any case, it is to be remembered that there will remain evidences of some scar tissue which will result from the artificial wound.

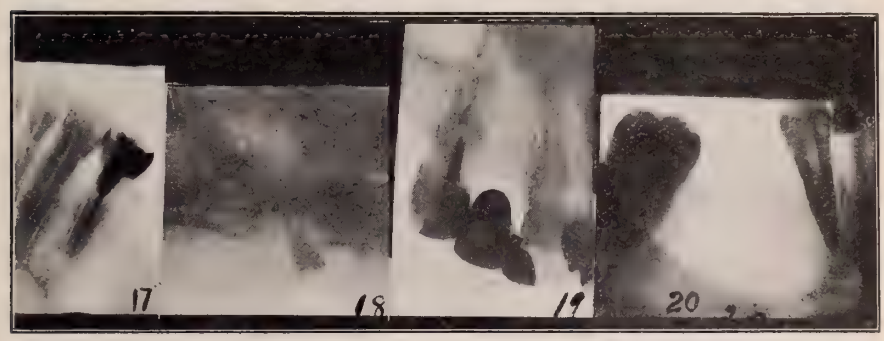

Fig. 17 shows canal filling after an additional hour's labor.

Fig. 18 shows an unerupted bicuspid and a retained cuspid root which caused severe pain and swelling in an otherwise edentulous jaw, on which two unsuccessful major operations were performed, as retained teeth were not suspected. When X-Ray located the trouble the treatment was comparatively simple.

Fig. 19 shows faulty cementation—an air space between dowel and gutta percha point, also separation of inlay abutment from central.

Fig. 20 shows large area of necrosis extending from third molar to second bicuspid, caused by putrescent first molar which was extracted without relief.

A chronic alveo-dental abscess is potentially also an alveolar necrotic process, and of all alveolar necrotic conditions by far the most numerous are those of dental origin. In the treatment of alveolar fistulae, therefore, an infected root canal or apical irritation should be suspected.

With the advent of radiography there is little excuse for experimentation, for in the vast majority of cases an imperfectly filled canal, an extruding root filling, or a resorbed root, together with the area involved, can quite distinctly be outlined on the skiagraph. In no department of the healing art is there so little excuse for treating empirically as in the treatment of alveolar dental lesions. Pericemental abscesses per se do not rightly call for consideration here, neither can we discuss here syphilitic, tuberculous or phosphorus necrosis, except to say that these should always be borne in mind in making a diagnosis. Nor have we the time to give in detail the treatment of these often troublesome alveo-dental conditions. Suffice it to say that with the cause removed, nature will reward our efforts with such results as nowhere else can be found in the human body. If a diseased root be the cause, we must direct our attention to it, and treat along approved lines, sterilizing and filling canal, amputating or even extracting it if necessary.

In amputating roots and curetting bone tissue, we should prevent pain by the employment of a local anesthetic, with which nearly all operations about the jaw may be performed painlessly. Cocain is a standard local anesthetic, but its employment is not without danger. Quinine and urea hydrochlorate is slower, more painful, but safer in its action, and one that has been used with considerable satisfaction by the writer for some time. Good surgery demands that we have strict regard for asepsis, that our operation be thorough, and in these cases, that no necrotic or carious tissues be left. Cutting well into healthy tissue is nearly always a wise precaution. Roots should be smoothly amputated and on a level or even slightly below healthy alveolar tissue, if we are to get the best results. With a sharp bistory the soft tissues should be cut sufficiently to permit opening through the process, that root may be seen, when apical portion can be removed by a bur and smoothed by small stones. A mild reinfection and considerable swelling of the soft tissue is to be expected in

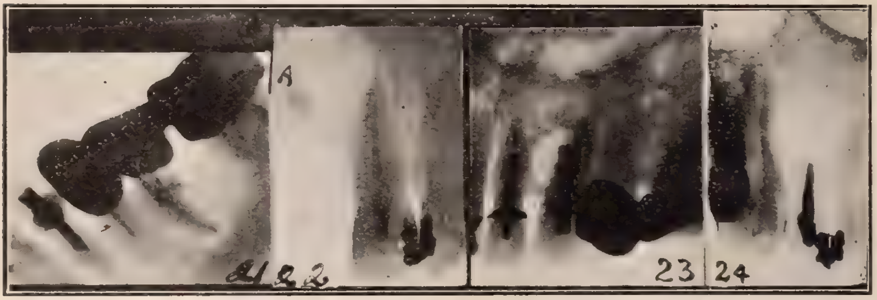

Fig. 21 shows improperly filled bicuspid canals, also first molar which was crowned and badly abscessed. The distal root, hopelessly so, was extracted. The mesial root was treated and filled and old crown contoured and replaced.

Fig. 22 shows a part of a necrotic area that extended from first molar to central. The central root is shown filled and amputated and the dark spot is an enamel bud about the size of a pea and probably the cause of the necrosis.

Fig. 23 shows a perforated cuspid root which was repaired with amalgam, the canal then filled to the apex and crown replaced. The tissues have filled in and the tooth is now giving good service. Note faulty cementation and imperfect canal filling of lateral.

Fig. 24, large necrotic area over amputated left lateral extending from central to cuspid and involving process labio-lingually also perforated into nasal fossa.

these cases, but no pains should be spared in placing the wound and keeping it in as aseptic a condition as possible. It should be washed out thoroughly with a mild antiseptic solution, and packed with iodoform or some other medicated gauze, which should be changed not less frequently than every other day. For the first week every day should be the rule. When granulations have made their appearance, if all the necrotic tissue has been removed, we have but to protect these repair cells until they have filled in the cavity. Bismuth paste can sometimes be used with good results. If much pain be present europhen paste can be used, but for all practicable purposes it is questionable if we have anything superior to narrow tape iodoform gauze for these conditions. Before dismissing this subject, let it be said that its importance entitles it to more extended consideration, but the wide scope of the paper will not permit.

The vast majority of neuralgias about the head and face, as well as a large percentage of the purulent antral empyemas, are of dental origin, and any form of treatment which does not recognize this fact will generally be rewarded with negative, or at best, indifferent results. The treatment of these neuralgias can be outlined only in a very general way, as their importance certainly entitle them to a very careful and lengthy consideration.

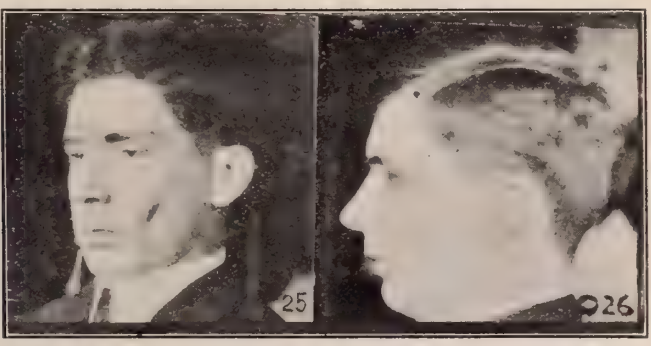

Fig. 25 shows a scar resulting from an alveolar abscess and antral empyema.
Fig. 26 shows this scar effaced to a very great extent..

Note—Dark areas in these skiagraphs show the presence of dense structures, hence we will have gold crowns and dowels, fillings and root canals materials represented by dark areas; the natural teeth and porcelain crowns less dark; the alveolar process still less dark. Where we have a liquefaction of the process or an abscess we will have varying degrees of lightness depending on the extent of the necrosis.

An impacted tooth, a pulpitis, or a pericementitis should always be suspected in cases of so-called neuralgia. Pulpitis, septic or non-septic, of third molars is frequently the cause, and devitalization or extraction should be the routine treatment. Systemic medication constitutes so small a part of their treatment that it can be dismissed with a few words, for, if the mechanical and local treatment, outlined in another part of this paper, be employed, there will be little necessity for systemic medication. A cathartic, diuretic or a diaphoretic can be used sometimes with good results, but as they are in nowise specifics, but rather depletents, no particular drugs need be designated. If the pain is unbearable a narcotic is justifiable until such time as local treatment proves successful.

Some of our most retractible forms of antral empyemas are the result of root canal infections, and the treatment here outlined must necessarily be of the most general character. In these cases we should not hesitate to extract the offending tooth, and at the same time all necrotic tissue should be removed, the pus evacuated and some approved method of treatment instituted. Since this subject is also of sufficient importance to demand separate and lengthy consideration no attempt is made at details, as each case must be treated according to the conditions present. It is hoped, however, enough has been said to show the importance of preventing, in so far as we can, these root canal infections and the necessity of dealing intelligently with them when they have already supervened, that we may protect the maxillary sinus from infections of dental origin and thereby save our patients and ourselves no end of worry and concern.

(*To be continued*)

ATTACHMENT FOR CROWNS AND BRIDGES—HYGIENIC*

By J. P. Carmichael, D. D. S., Milwaukee, Wis.

I DESIRE to show a method of attachment in crown and bridge work, without bands or other obstructions that retain foreign matter in contact with the gum margin. I have here a model showing three styles of bridge attachments; the central incisor shows a Carmichael attachment, which I will first describe:

After forming paralleled grooves, the lateral side edges are beveled and a groove is then formed across the cutting end of the tooth connecting the two side grooves. (Fig. 1). Then place a thin piece of wet silk over the tooth; over this place a thin sheet of pure gold (Fig. 2) (heavy inlay foil) then over the gold wrap a strip of silk, and with thumb and finger bind it firmly in position upon that portion of the tooth to which you are to form the attachment. You now have the gold foil between the two layers of silk. With the ordinary instruments the gold can be rubbed into the grooves without tearing it. (Fig. 3.) The gold is then removed, trimmed to the proper shape and covered with wax; while the wax is still warm, upon the gold base, place it back upon the tooth and hold it in position with a strip of wet silk; with an instrument rub upon the silk until the wax beneath is shaped to the proper contour, and while holding it in position with the silk allow the patient to close the teeth to form the proper occlusion. The work in the mouth is now completed and the attachment is ready for casting.

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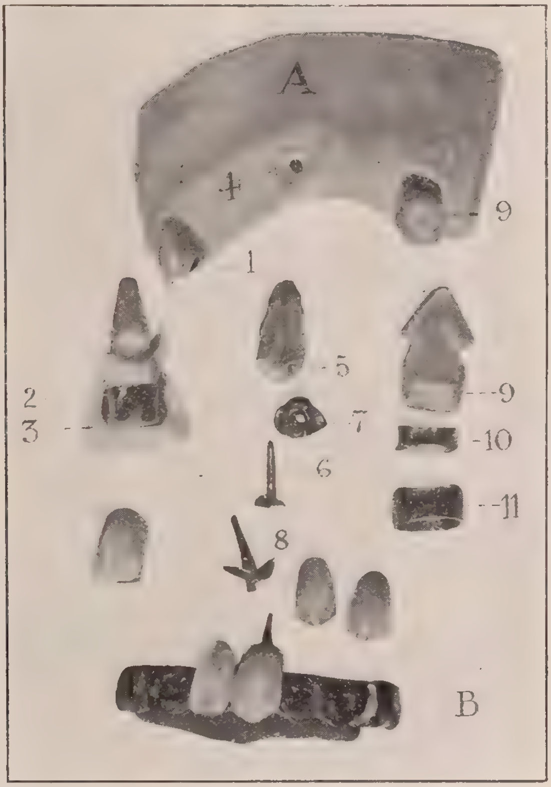
*Given as a clinic at Indiana State Dental Society, 1910.

The next abutment of this bridge is a cuspid Art. Crown. The preparation of the root as shown in Fig. 4. consists in beveling the root labially slightly below the gum margin. On the palatine surface a shoulder is cut (Fig. 5) to equalize the strain and it aids materially in the anchorage of the crown to the root. The root canal is enlarged and a countersink is made with a large sized bur into the face end of the root. I form



A shows model with teeth prepared for three bridge abutments.
No. 1 shows central incisor and groove for Carmichael Attachment.
No. 2, wet silk covering portion of tooth prepared for fitting.
No. 3, base of pure gold, burnished to the tooth over the silk.
No. 4 shows face end of root and counter sink for post. No. 5, shoulder, cut on palatine surface.
No. 6, rolled crown post after being enlarged to fit root canal and the end burnished down upon the cap.
No. 7, cap of pure gold, covering face end of root.
No. 8, completed attachment after casting the metal into the post and over the cap.
No. 9 shows beveling the root for gold crown.
No. 10, thin gold band fitted to root.
No. 11, gold band of proper width contoured and fitted over the thin band.
B—Completed bridge ready for cementing on the teeth.

this cone-shaped post (Fig. 6) of thin pure gold or platinum, and pass it into the root canal. With an instrument of proper size enlarge this cone-shape post to the size and form of the root canal and into the countersink.

Now remove the post and see that an opening is left in the small end, which facilitates the flow of metal through the post; then form a thin gold cover to the end of the root (Fig. 7); punch an opening through into the canal and pass the hollow post through the cap into the root canal and rub it down upon the gold cap covering the face of the root. The two parts are now drawn off together when they are flowed with wax, filling the hollow post and covering the cap to the desired thickness. It is then completed by casting into the post and over the cap as shown in Fig. 8.

The molar gold crown shown on this model is made by beveling the root (Fig. 9) and fitting a narrow thin gold band, about thirty-six gauge. (Fig. 10.) An impression and articulation is taken and upon the model fit and contour a gold band of medium thickness and of proper width (Fig. 11) over the thin band and complete your crown upon this model, soldering the thin band inside. This method throws the strength into the crown where it is most desired and it will finish to the root without any perceptible edge. The teeth as shown on this bridge are twentieth century pin teeth, cemented on; the pin holes are correctly obtained by placing small carbon points in the pin holes left in the wax after drawing off the teeth from the section preparatory to casting. By using different colored cement in cementing the teeth on, the shade can be slightly varied, which is a great advantage. This method makes it easy in case of repair, and to all practical purposes the teeth are as secure as when soldered.

A bridge like this can be set for several days or a week with paraffin, and if you desire to make a change in the color of teeth drop the bridge in dilute muriatic acid over night when the teeth can be removed.

A REINFORCED GOLD MATRIX INLAY*

By Dr. Henry Barnes, Cleveland, Ohio

MY first introduction to the gold inlay was in the fall of 1903 when one gold inlay, said to have been inserted in the mouth twelve years previously, was shown me. This, though only a single case, demonstrated, to my mind, the possibilities of this class of work, and I immediately interested myself in its experiment.

The investment method was tried with indifferent success; since then my endeavor has been to produce an inlay without investment. The progress was very slow and somewhat discouraging because I clung to the solder-made inlay. Gradually I began to use pure gold in a platinum matrix and with a success which was very encouraging. I had supposed this to be the acme of possibility, but contact with others, who had introduced various modifications, convinced me that I was in error, and, not being wedded to my own ideas, I was in a position to use any suggestions advanced.

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*Read before the Toledo Dental Society, 1910.

While I present to your notice today a modification in the construction of the inlay, which is for my purpose the best yet, I still hold myself ready and willing to adopt any new suggestions which will, in my judgment, make the technic of the work more simple and at the same time augment or at least not lessen its quality.

It is not to be inferred from the foregoing that the cast gold inlay is condemned, but I do say that for myself I much prefer the sweated inlay. My reasons for this statement are that I can produce a better sweated inlay, more rapidly and with less labor than I can in casting the inlay. I can make these inlays, in many cases, in much less time than it would require to insert a malleted filling and with far greater comfort to the patient.

The day of defense of the gold inlay has passed. It has now attained a majority in years and its future must be in the direction of betterment until time brings an ideal filling. This much hoped for millennium may not arrive in your time or mine and indeed may never come, therefore we must improve that which we have as the years go by.

Whether we are wedded to the cast inlay method or not, it is to our advantage to be acquainted with the technic of other methods in order that the one best suited to the case may be employed.

Speed in operating is greatly to be desired, but speed in excess at the expense of quality is to be condemned. Therefore, when I refer to speed it is as a relative term. In a majority of cases the sweated inlay can be produced in less time than it takes to make a cast inlay—in many cases within the time requisite for the formation of the wax model—this statement may partake of the nature of a boast, but I am prepared to prove by clinic that this is a fact.

TECHNIC

Little in the way of equipment is necessary for the making of the sweated inlay.

Instruments:

Flat nosed diamond pliers.

A piece of orange wood spatulate at one end and squared or rectangled point at the other.

Soft rubber (unvulcanized).

Set of Mason's matrix forming instruments.

Charcoal block.

Lane blowpipe.

These supplemented by such instruments as are usually found in any dental office.

Material:

Pure gold for matrix—not less than 3-1000 inch in thickness.

Moss fibre gold or Ney's No. 4 soft gold.
22k. gold plate.
Borated vaseline.

Before proceeding to a description of the clinic, I desire to say that the technic is not difficult, especially to those who are familiar with the formation of the platinum matrix. A little practice with the blowpipe will soon place one in possession of the ability necessary to make a very good inlay. The possibilities of this method, when the technic is mastered, are very great, crowns, dummies, abutments and extensive occlusal restorations can be made, and with ease. The cast inlay, when imperfect, as is sometimes the case, may be brought to a state of perfection by this method:

First—The cavity being prepared with sufficient anchorage to prevent dislodgment during mastication and with sufficient draft to permit of easy withdrawal of the matrix from the cavity and with edges slightly beveled.

Second—The matrix is made as follows: (describing a mesio-occlusal cavity in the lower first molar): Cut matrix gold large enough to completely cover cavity when in place and with additional gold enough to extend from the cervix or below the cervical margin to the mesio-occlusal angle. This additional flap of gold is turned back precisely as you would fold a sheet of paper preparatory to placing in an envelope. Have the folded edge as smooth as possible, making a sharp edge, then anneal and place folded edge in approximal space at cervix. Use the spatulated end of the orange wood to smooth matrix over margins—the square end to force matrix into cavity. When necessary, the soft unvulcanized rubber may be used to force the matrix to all parts of the cavity, pressure being exerted by means of the orange wood stick or by a forced occlusion. The additional gold flap is intended to be used as an inner approximal matrix and becomes the mesio-approximal surface or wall of the inlay. This inner approximal matrix is burnished to the mesial contour—to the mesio-lingual, mesio-cervical and mesio-buccal margins and just over the occlusal angles by means of the spatulate end of the orange wood stick. The matrix instruments are used to secure sharp angles for matrix over margins. The gold matrix being now complete, a thin band of metal (preferably copper) is placed in the restored approximal space to give stability and prevent the matrix from being forced out of shape while packing moss fibre gold into cavity. The outer metal matrix may be held in place by the fingers sometimes aided by a small wooden wedge at the cervical margin.

Third—Now use moss fibre gold (I now find that Ney's No. 4 soft gold foil answers quite as well) packing same into matrix while in cavity, until the desired form is reproduced. Use for plugger the orange wood stick and pack rather solidly with hand or light mallet pressure not condensing like the ordinary filling.

Fourth—Remove matrix from cavity-place on charcoal block and sweat 22k gold plate into fibre without flux, using small mouth blow pipe, until the fibre gold has absorbed just enough to fill its porous form. Should the mesial surface be a little roughened as sometimes occurs from packing the fibre gold, a very little borated vaseline may now be used on this surface to aid in flowing over it a piece of 22k gold plate, thus obtaining a plus contour and contact point.

Fifth—The inlay is now ready to try in cavity after trimming off the overlapping edges of matrix. A little grinding and polishing, part in and part out of the mouth and the inlay is ready to insert. Should it be desired to work from models the entire technic may be carried out in the laboratory.

One of the many advantages of an inlay made in this way is that it produces a good overlapping edge on all margins. With the technic carefully observed, failure will seldom result.

A METHOD OF REPAIRING A DIFFICULT BRIDGE FRACTURE *

By Dr. E. J. Zeidler, D. D. S., New Orleans, La.

THIS case, necessitating the repair of a bridge, presented difficulties, both because of the size of the piece, and because of the nature of its anterior attachments. The bridge consisted of fourteen teeth, and was attached to the cuspid roots and to the second molars. The molar attachments were made by means of gold shell crowns and the cuspids, for ethical reasons, had been fitted with full banded Richmond crowns.

The point of fracture was located on the left side, occurring in the joint between the cuspid and the first bicuspid facings. The difficulty in attempting to remove the bridge, especially on account of the cuspid abutments, is readily seen, and I was at a great loss as to how to proceed in overcoming that difficulty, but I succeeded by proceeding as follows:

Making a slit in the lingual side of the molar crown permitted me to remove that portion of the bridge consisting of that abutment and the three porcelain faced dummies between it and the cuspid. After trimming the cuspid crown so as to remove the rough edges caused by the fracture, I stoned a deep depression in the gold backing of the Richmond crown, and directed its deepest portion towards the root end. This depression was made to extend from a point near the mesial edge clear across the width of the tooth and took in the distal edge, being made as deep and as wide at that point as possible, without exposing the back of the facing.

The gold still overlying the root, now worked down to a thin plate, was cut through with a bur at a point almost directly in a line with the root canal, but a little further towards the lingual portion. I reamed out the root for the reception of a fourteen-gauge iridio-platinum wire post, and in doing so cut partly into the side of the old post so as to have the new post located in the canal as far as possible. This was to avoid the damage of perforation and to avoid any weakening of the strength of the root. After fitting the post snugly it was removed and slipped through a piece of twenty-four karat gold plate of thirty-two gauge. The post, carrying the plate, was then placed in the root, and the plate roughly burnished into the depression.

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*Read before the Louisiana State Dental Society, 1910.

After removal, the plate and post were tacked together by a small particle of solder and the piece carried back to the mouth for a final accurate burnishing and trimming. The post end was allowed to project in the direction of the lower teeth so as to make it come away with the impression without danger of being inaccurate. The repaired molar crown from which the dummies had been previously detached, was put in position on the tooth, bite taken, and then with the plate and post of the cuspid was brought out of the mouth in the plaster impression.

From this point the work was carried on in the usual method, and in soldering, I filled with solder the depression in the gold plate which had been burnished into the cuspid crown. The projecting end of the post having been previously cut off, the cuspid crown attachment was now roughly dressed down and after the piece was cemented into place was further smoothed and polished so that it presented a continuous surface with the backing of the Richmond crown.

THE PRACTICAL APPLICATION OF MINERAL STAINS IN MODIFYING THE SHADES AND COLORS OF ARTIFICIAL TEETH*

By F. E. Roach, D. D. S., Chicago, Ill.

THE object of these stains, primarily, is to change the tints and modify the colors of the various teeth as supplied to us by the dental manufacturers, in crown, bridge, plate work, inlay work, etc.

The stains that we have used in the past have been for the purpose of producing freakish conditions rather than the changing and blending of the colors of the teeth.

The technique of using these colors is very similar to the manipulation of any oil color excepting that in our use of them they are to be applied in a very thin film over the entire surface of the tooth in order to make a symmetrical blend of the color. With these colors, any shade or color of tooth may be produced—with the six colors known as the Lenox colors—ranging from the lightest to the darkest, that are to be found in the natural teeth of anyone.

The essential advantage of these colors over those of the S. S. White and Brewster stains is that they are very much more easily applied, owing to the finer pigment in the colors and the use of the clove oil preparation or glycerin as a vehicle. The colors fuse at from fifteen hundred to two thousand degrees Fahrenheit, and while some of them will burn out at a temperature beyond this point, it will be found that the ochre yellow and the blue black will stand a heat of twenty-two hundred degrees Fahrenheit very satisfactorily.

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*Given as a clinic at the Cincinnati Odontological Society, 1910.

The colors that I have found to meet the requirements most satisfactorily are as follows: Ochre Yellow, Blue Black, Deep Sea Green, Assyrian Blue, Venetian Red and White Enamel.

The claim that I make for the use of these stains by the profession is that we are placed in an absolutely independent position in regard to the matching of all conditions of mottled and streaked conditions that we so frequently meet with, especially in the matching of individual crowns and partial dentures, also in the tinting of porcelain inlays after the matrix has been stripped, and upon trial in the mouth, the color is found to be slightly off. This, of course, applies to high fusing porcelains.

Another invaluable use of the stains is the coloring of sets of teeth to comply with the Royce method of shading, namely, that of making the cuspids darker and shading down either way from the cuspids to a lighter shade.

PHYSICAL CULTURE FOR DENTISTS

By G. E. Harter, Toledo, Ohio

Continued from Page 41, January Summary.

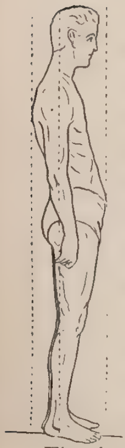

Fig. 1.

In Fig. 1 we have a quite correct representation of the incorrect, slouchy, inelegant and inefficient standing posture of the vast majority of men and women of the present day. Notice the sagging forward of the abdomen and shoulders, the flattened chest, the sloping forward of the neck, and the general appearance of lassitude and indifference.

Ask any physical culturist whether our picture is an exaggerated one, and he will tell you that it by no means represents an extreme or an at all unusual case. If you take up and follow the suggestions herein for a week or two, you will begin to notice the standing posture of the people you meet, and, in a very short time, will be able to point out those who stand correctly and those who do not. Then you will agree with the writer that Fig. 1 is rather flattering than otherwise.

In this case the body has been allowed to settle down upon the legs and bony structure, pushing forward the abdomen into disagreeable prominence, rounding the shoulders, pulling the head out of its natural and powerful upright position, and giving the entire body a weak, unattractive pose, and one that is sure to react upon the entire organism, producing all sorts of physical ills that are, of course, attributed in a vast majority of cases to any cause save the correct one.

This incorrect attitude is just as common among women as among men, and perhaps more so. This is much to be regretted, as far more serious ills, entailing long lives of suffering and premature death, are brought about by this attitude in the case of the former, the entire maternal organization being thrown out of proper alignment and position, with resulting abnormalities all along the line.

Notice that only the abdomen and the toes touch the line in this case. Try this for yourself. Standing as you usually do, walk up to the wall until your toes touch; then notice what other parts of your anatomy are in contact.

In Fig. 2 we have another unnatural, injurious, ungraceful and inefficient pose, assumed by some who seem to wish to attract attention. While by no means correct, it is far less injurious, but, at the same time, less powerful than the slouching attitude shown in Fig. 1. This is the "Pouter Pigeon" attitude referred to in the January paper. We have actually seen this position illustrated in life, and heard it seriously recommended by those who should know better. While allowing the lungs full play, the angle of the spine is so great as to throw the entire weight of the torso upon that small section of it below the waist line. It is neither natural, forceful nor beautiful, and is to be avoided, as are all such attitudes.

An example of this exaggerated pose may be seen almost any day in the streets of any city. The subject probably is a man of wealth and leisure, whose sole object in life appears to be that he may be seen of men. Apparently most of his waking hours are spent in the streets. It is, of course, impossible to carry the body in this position and still walk in a natural, easy manner. The forearms and elbows are held stiffly in against the sides, the lower half of the arms swinging rapidly with each step, and the entire action of the walk may be summed up in the one word "strut." However amiable or agreeable a man may be, such a pose is sure to impress observers with the vanity that alone can inspire it.

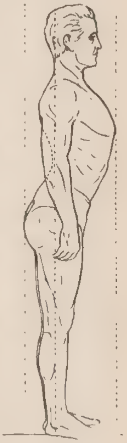

Fig. 2.

The correct, easy, natural and forceful position, the one position insuring greatest comfort, ease, grace, poise, health and power, is shown in Fig. 3. Here the lips, chin, chest and toes fall into line with each other, with the feet turned outward at an angle of sixty degrees. In this position the body is capable of developing the maximum of readiness, balance and endurance. The chest is given the greatest prominence at the expense of the abdomen, which is, very properly, compelled to assume a more modest position than in Fig. 1, allowing the lungs full and natural play.

A glance at our picture is sure to give the impression of readiness, alertness, poise and efficiency. The shoulder, hip and ankle joints are carried in line with each other; the knee joints slightly forward; the entire attitude suggestive of readiness to spring forward. The head and neck are carried in a beautifully erect position, bringing the collar-bone into the horizontal position natural to it.

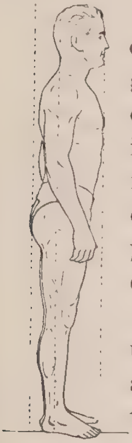
Fig. 3.

In this position the muscular system is brought into that degree of action necessary to relieve the skeleton of the dragging weight imposed upon it by the carrying of the body in either of the positions shown in Figs. 1 and 2. This does not imply more labor, but less. Beginning in conscious effort, fatigue is pretty sure to result just at first; but soon, the muscles will respond to the demands made upon them, the new position will become a habit, bringing with it a degree of bodily comfort and exhilaration never before known.

Many of the muscles are so cramped and confined by the unnatural carriage of the body that the circulation is impeded, and what often passes for muscular fatigue is simply the irritation naturally arising from such a condition, brought about not by the use, but the non-use and the cramping of the muscles.

This irritation often takes the form of numbness, particularly when sitting. The arm or hand or some other part "goes to sleep" as we say. On attempting to rise quickly, a stiffness of the joints is noticed, requiring some moments to be overcome.

In sitting as well as in standing the body must be held in such position as to bring the muscles into play; and precisely in proportion to the extent to which the muscles are used normally will there be absence of fatigue in sitting.

Our cousins, the British, say that Americans as a nation are the poorest sitters in the world; and they are far too nearly right. Most of us, instead of sitting upon that part of the anatomy intended by nature to be so used, slide forward in the chair until the entire weight of the body rests upon the sacral region of the spine, "the place where the tail ought to be," in not a few cases bringing about irritation resulting in serious maladies requiring the aid of the surgeon.

Persons who sit in this position, and sit much, are sure to become round-shouldered, and to be troubled by almost constant pain and a sense of weakness in the "small of the back." Always sit well back in the chair so that the lower part of back touches the back of the chair.

The instructions for acquiring the correct standing posture apply to the sitting position as well. In order to acquire comfort, either sitting or standing, the muscles of the stomach, abdomen and back must be developed and brought into their full and natural play. This is best done, I am almost prepared to say, can only be done, by conscious effort directed upon that one point to the exclusion of all else. No apparatus is required. I have used exercising machines, dumb-bells, clubs, chest-weights, rowing machines, and a lot of others, but in my opinion, the conscious, intentional and continued contraction and expansion of the muscles of the abdomen produce much more satisfactory results and in less time than any of them.

Draw in the stomach, that is, contract the muscles that support the abdomen, as far as possible; hold them in that position until they begin to feel fatigue; then slowly relax, "let out," until the abdomen sags. Repeat this every time you think of it. Do it standing, sitting or lying down; the position is immaterial. Do it while breathing naturally; do it while practicing the restrained or governed breath; do it while holding the breath in any of the breathing exercises recommended; do it not once or twice, but a hundred times at a period, and repeat the periods as often as possible every day.

This is one of the very best developmental exercises ever prescribed for the weary dentist; it brings rest, strength and poise; more than that, it is, in itself, unaided by drugs or any other means, one of the finest and most certain remedies for constipation ever discovered. It is my opinion, based upon years of observation and practice, that constipation is impossible in the face of this exercise faithfully followed.

Just try drawing in and pushing out the abdomen for two or three hundred times a day for a day or two. Try to follow the action of the attendant motion upon the colon; think what a churning up and down that great intestine must be subjected to under the treatment prescribed; and you will realize that its complete evacuation is only a question of persistence.

This exercise may be practiced anywhere and at all times. Practice it while standing at the chair, sitting at the desk, at the workbench, while walking on the street, in the car, at home—anywhere and everywhere, hundreds of times a day, a hundred or more times at each period; keep it up until you do it unconsciously.

It is my opinion that this one exercise alone will correct the standing position, but it is just as well to give it a fair chance. In walking, hold the abdominal muscles well contracted; carry chest and face well forward over the advanced foot, and think that you are lifting the body by the inflation of the lungs. The feeling of buoyancy that accompanies this exercise is by no means deceptive; it is very real, and is a promise of the condition of physical fitness that is soon to become permanent.

Walk with a free, long, easy stride; permit the leg to swing to its full arc; avoid a mincing step, as well as any hard, jarring, soggy, slumping motions. Keep the whole body well in hand while walking, bearing in mind the idea that your muscles are to support the body, and hold it taut and trim. Do NOT wear rubber heels, no matter what the other fellow, who has them for sale, says about their beauties. They are crutches, and, as such, are to be avoided. You have within you all the elasticity you need. Develop it. *(To be continued.)*

THE RELIEF OF PAIN DURING DENTAL OPERATIONS*

By George T. Gregg, D. D. S., Pittsburgh, Pa.

FROM the beginning of dentistry, we might say, the word dentist to the general public has been synonymous with pain. People come to our office and say, "Doctor, I have put off this visit as long as possible, I would rather do anything than go to the dentist. I can easily endure the pain of a surgical operation, but cannot bear the shock of having my teeth filled." Mortifying expressions of this sort are familiar to us all. They bespeak a reputation of which we, as a profession, certainly cannot be proud. We read a great deal on almost every subject in dentistry excepting that of "the relief of pain," which I think is one of the most important. Think of the happiness that would be caused should some physical change take place in the human anatomy that would permit all dental operations to be performed without pain! Think of the nervous energy that would be saved and of the great number of busy dentists there would be! Pain has been our bugbear since we have given dentistry a thought; it has stood between us and thorough operations, caused us the loss of nervous energy, has kept patients away from our office, and has prevented us from doing a great deal of good to humanity. Surely there are no arguments against the relief of pain in dentistry, yet it is surprising how few men bend much of their energies toward its elimination. The principal arguments put forth are: It takes too much time. My patients will not pay for it. My patients have confidence in me and think what I am doing is correct, and therefore tolerate the pain without complaint. Some have even told me that it was a greater strain on them "to bother about relieving pain than it was to go right ahead and let the patient suffer; sharp burs and a light touch will accomplish all that is necessary." To me this has always been a mystery.

GAINING THE CONFIDENCE AND EARNING THE GRATITUDE OF THE PATIENT

Since the beginning of my dental career I have tried all means at hand to relieve pain, and my efforts have repaid me many-fold, not only in gratitude from my patients, but because I can do better work and shorten the sittings, thereby preventing strain on myself and saving my patients fatigue and shock. Patients leave the office, not in a state of dental fatigue, but generally happy in the thought that they can return and have the remainder of their work done without suffering. Patients whose teeth have been carried to the limit with gutta-percha and cement because they were not able to endure the agony of having the cavities prepared for permanent fillings, find they are not to be hurt and will continue to come back until their mouths are in good condition; they are willing to allow me to undertake more extensive pieces of work. The old adage, "To do thorough work, you must hurt," should be reversed, "To do thorough work, you must not hurt." There is a small percentage of patients who will undergo the pain of having a cavity thoroughly prepared along scientific lines.

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*Read before the Odontological Society of Western Pennsylvania, 1910.

Many inlays have failed from improper preparation, and not always because of the lack of knowledge. The operator, trying to avoid sensitive parts depends too much on cement adhesion instead of on mechanical anchorage as well as cement.

GRATITUDE

If you wish your patients to speak well of you behind your back, don't hurt them. If you want to have them heap abuse upon you, torture them while they are in your chair. Is it not a pleasure to you to have a patient leave your chair saying: "Doctor, that was grand! you did not hurt me!" It partly pays you for the operation. On the other hand, think of the patient who remarks, "You almost killed me," and who, whenever your name is mentioned, has unkind things to say. You can do a beautiful piece of work and find that it will not be appreciated so much as are your efforts to alleviate pain. A filling at the gingival line on the buccal or labial surface will be pointed out with the remark, "My, oh, my, how that hurt!" It may be a beautiful filling, but it is not the workmanship that is considered, but the suffering endured while the filling is being put in. Dentistry at best is very trying, and a few words of gratitude once in a while make our lives happier. Every man who is inflicting pain undergoes severe strain, and in time that nervous strain will break down anyone, no matter how strong he may be. I have never been able to inflict pain without undergoing a strain. Many times I have lost sleep thinking of how I would excavate a buccal or labial cavity that could not be touched with an instrument without causing a wince. You all have had the same experience. There are patients whom you dread to see come into your office, because of the worry they cause you. These are cases in which we should be able to work without inflicting pain. They sap our nervous energy, put us in an irritable state, and send us home exhausted at the end of our day's work. If we can get through the day without such worries, we feel better, are happier, treat our patients better, and everything goes along smoothly.

MEANS OF INDUCING ANESTHESIA

The days of trying to desensitize cavities with hot air and topical applications of caustic soda, carbolic acid, formalin, cocain, sprays, and especially with sharp burs, are over; at least they ought to be. These means are not practical and cannot be used with success. Sharp burs are good things to have for rapid cutting, but even with sharp burs you cannot excavate sensitive dentin without inflicting pain. They will alleviate pain but very little, no matter how slowly you run your bur, or how delicate a touch you may have. Cataphoresis has been tried, and found wanting. The rubber dam has always to be applied, and there are places where it cannot be used. Cataphoresis takes a great deal of time, the patient has to sit perfectly quiet, which is a great strain, and there is more or less pain connected with the application of the current; also you may cause the pulp to die. At times, even after a half hour's application, the cavity will not be desensitized. Cavities below the gum line, along the buccal surfaces of upper and lower third molars, are simply out of the question with cataphoresis The different sprays, such as ethyl chlorid and the Van Wyck-Kerr ether spray, will desensitize a cavity, but not without a good deal of time and patience, and with more or less pain in the majority of cases. The apparatus and the disagreeable odor of the ether are very objectionable to the patient. I have made an effort to give a fair trial to anything new that I have heard of along this line, and have abandoned them all except the high-pressure syringe and general anesthetics, especially nitrous oxide and oxygen—but never chloroform! To my mind anyone who administers chloroform or permits a physician to administer it in his chair is very foolish, and takes a great risk. Every month you can read of a death by chloroform that occurred in some dental office. Why should we administer chloroform, which shows a death rate of about one in three thousand, when we can administer nitrous oxide and oxygen, which has absolutely no death to its discredit?

Right here I want to recommend to you for reading, Dr. Wm. H. DeFord's new book on "General Anesthetics in Dentistry." No dentist who contemplates using a general anesthetic in his practice should be without it. He says: "Bold in other directions, commendably progressive in all that relates to manipulative ability and artistic development, the dental surgeon shrinks from anesthetics. He cuts living tissue, lacerating the nerves themselves, 'performing laparotomies upon the teeth,' so to speak, and the anesthetic usually employed is that of a witty speech or an amusing story, while the patient suffers, cringes, agonizes almost to the state of collapse. In this enlightened age no surgeon, except a dental surgeon, permits a patient to undergo, without an anesthetic, tortures equal in severity and duration to which one submits during the average dental operation."

Dr. Rhein recently reminded us that we as a profession occupy a unique position, inasmuch as we claim to have first introduced the benefits of general anesthesia by means of nitrous oxide, and yet today we find ourselves in the lamentable position of being subject to criticism of the medical world because our work is so much dreaded and feared by patients. Dr. G. V. I. Brown said that if he should resume the general practice of dentistry, he would use nitrous oxide a thousand times where formerly he used it once.

NITROUS OXIDE AND OXYGEN

The majority of dentists are averse to administering anesthetics. They say, "I don't extract teeth, and have no use for a general anesthetic."

Extracting is a small part of our practice. I do not average one extraction a month, yet probably administer an anesthetic, nitrous oxide and oxygen, every day in my practice, principally for the excavating of sensitive cavities. This has given me more satisfaction, afforded me more gratitude from patients, and helped me out of more tight places than anything else during my experience in dentistry. It will do just the same for everyone who spends a little time in learning how to administer it. Nitrous oxide and oxygen can be used in any painful operation that comes under the head of operative dentistry, such as excavating sensitive dentin, exposing congested pulps, lancing abscesses, desiccating cavities, amputating roots, and extracting teeth. The results are always positive. If you get your patient in the proper state, you can be sure of painlessly excavating cavities that would otherwise not bear the touch of cotton. The value of this method consists in that it is universal. First get the confidence of your patient; this is absolutely essential for success. Every man has his own way of doing this. If your patients believe in you, you will have little trouble. If a patient presents for the first visit, I have found it a good plan to study him and get a good idea of the temperament with which I have to deal, before adopting any manner of procedure. If the patient has had some unpleasant experience with an anesthetic allay his fears. Tell him that the anesthetic which he is to take is nothing like ether or chloroform, that there will be no bad effects, that it is perfectly safe, that he will not become unconscious, and will feel perfectly normal a few moments afterward. Show him that you are sincere in trying to relieve him from pain, and you will have little trouble.

Once a patient has taken nitrous oxide and oxygen for the excavating of a sensitive cavity, your troubles with that patient will be over.

Never mention laughing gas to your patients. Generally they have heard some exaggerated story of laughing gas, and you might excite them more. If they ask what gas it is, simply say it is nitrous oxide and oxygen.

See that your patient is comfortably seated and can breathe freely; take the ordinary precautions; adjust the nasal inhaler, and tell him to inhale and exhale through the nose, till a peculiar feeling comes over him. Impress on him not to become alarmed at the odd feeling; that he must be in that state in order to get the proper effect; have him inform you at the approach of the feeling and proceed to operate.

If you cause pain, have the patient breathe in a little more; very seldom will you need to let him become unconscious to accomplish the desired result. Have your patient keep his eyes open, reassure him by talking to him, that you can operate in this state almost indefinitely.

Of course you must have an assistant to operate the gases; you yourself must devote your entire attention to your patient.

I have been using this method, with very few exceptions, for over three years. In that time I have only had two cases that I would really call failures, and only in three cases was nausea experienced. One of these was a young man to whom I administered the anesthetic for the accommodation of a surgeon, and whom I kept in an unconscious state for one hour and twenty minutes, using three cylinders of nitrous oxide and one of oxygen. The patient had not been prepared for an anesthetic. In both cases the sickness was of short duration. Today I would be inclined to relinquish general practice rather than conduct it without the aid of nitrous oxide and oxygen.

DISCUSSION.

Dr. W. S. Cook: Dr. Gregg's statement that it is surprising how few men spend much of their energy in efforts to relieve pain is a pretty hard one to take. However, it is to be hoped that we will all benefit by the talk to which we have just listened.

Dr. Gregg goes on to say that he often lies awake nights thinking of his work, and wondering how to best secure the alleviation of pain in the cases brought to him. This makes him nervous, and it will make any man nervous. This thing of carrying your practice home with you and sleeping over it is going to make you nervous. It is the worst thing a dentist can do.

Those who have had some experience in this work feel as I do, that unless the patient has confidence in your ability to do his work, it is useless to try to work for him. The first stepping stone, therefore, is to get the confidence of the patient.

Dr. Gregg goes on to state that we should not allow chloroform to be used in the office. When it comes to the extraction of teeth I prefer to have the family physician give the anesthetic, and I do the work. I am then sure that everything is all right. I am not a bit afraid of chloroform, and use it once in a while, not often, as I seldom have occasion for its use. I have never had any trouble whatever in cases where I have used it.

As far as nitrous oxide gas is concerned, I think within the last three years more has been used than was used a short time before, but fifteen years ago it was used many times to what it is today. I think Dr. Gregg is making a step forward in the elimination of pain, and by our next meeting I feel confident that more of us will be using what he is using, nitrous oxide and oxygen, and I trust that we will have the same success.

Dr. A. W. McCullough: One of the greatest bugbears we as dentists have to contend with is the relief of pain. Everybody seems to dread pain. One method of alleviating pain is by the administration of nitrous oxide and oxygen. However, we cannot afford to use an anesthetic with all of our patients, as some of them cannot afford to pay for it. In my opinion, we have gone a great way toward the alleviation of pain when we have gained the confidence of the patient. We often secure the alleviation of pain by taking away the fear of pain. Fear sometimes causes the patient more suffering than real pain. I have found it a good plan to talk pleasantly to the patient, explaining to him what I am going to do and why I am doing it, and giving him to understand that the little pain he will be called upon to suffer is for his own good. When the N. O. and O. outfit first came out I had one in my office, but I had more trouble trying to make my patients feel that they were not going to be hurt than I had in preparing the cavity without the use of an anesthetic. Perhaps I had not enough confidence in the apparatus myself.

I think about one-half, probably more than one-half, of the annoyance of pain caused by operators is due to roughness. They do not handle their patients delicately enough. Some dentists get so interested in their work, or get in such a hurry to get through that they forget their patients are human. They pull the head from side to side in a not too gentle manner; are not careful in placing ligatures; do not take the time to reach for the proper instruments to perform certain operations; are not careful to keep away from the margin, and do so many annoying things that they have a nervous patient ready to jump at a touch. We should cultivate more gentleness in touch, and work fast, but not get in a flurry. Do not try to do one-half hour's work in ten minutes, as nothing can be done well which is done in such a hurry. If necessary, take an extra ten minutes to relieve the nervousness of the patient, and to calm the fear that you are going to hurt him. Sharp burs and cutting instruments go a long way toward the alleviation of pain.

Of course there are cases in which nothing will alleviate the pain except the use of a general anesthetic; and in such cases there is probably nothing better than nitrous oxide and oxygen, which Dr. Gregg recommends. I have had some success in its use. By the use of compressed air I have been able to obtund gingival cavities, and it has given a great deal of satisfaction, the patient experiencing very little pain.

Dr. Gregg warns us against the use of chloroform. I notice in one of the dental journals this month that during the extraction of teeth under chloroform the patient died. The next article told of the death of a patient under the influence of nitrous oxide, and in the same journal was an account of a patient dying from fright. So we are not entirely safe with any of them. I believe, however, that nitrous oxide and oxygen is the best we have at present.

I began to think sometime ago that I talked too much to my patients; that I should get them in the chair and immediately set to work, and put my mind on my work. Lately, however, I have changed my opinion, and I think it is a great help to talk to the patient, to tell him what you are doing, not in a bragging way, but that he may understand what to expect from the work you are doing for him. Thus you will help in the educational movement which is being talked about so much today.

We form an opinion of a man the first time we see him and we can generally tell whether we can have confidence in him or not. This is true of a patient entering a dentist's office, and it would be well for us to keep this fact in mind. Let us also remember that one of the first things to alleviate is fear, by being as gentle and considerate as possible; and we have done a great deal toward the alleviation of pain when fear is eliminated.

Dr. H. F. Koontz: Humanitarian dentistry, to my mind, is the key to dental education. Note the expression on the child's face when informed a visit to the dentist is necessary, even though that same child has never had any dentistry done. The common expression from parent, guardian, teacher or playmate, "How I dread to have my teeth fixed," creates the mental picture of horror; and all the careful manipulation and skill cannot overcome the barrier that exists between patient and operator. Explicit confidence is more than half of the anesthesia, and allays a great proportion of the fear, but to promise a painless operation under these conditions is like reckoning without the dog. You know the dog won't bite and I know the dog won't bite, but the dog doesn't know it. And so we reap our reward—a patient, suffering humanity, and a nerve-racked profession.

I want to compliment the essayist on giving us this paper. It is not founded on theories, but on facts. It represents actual experience, and he is accomplishing just what he claims. Imagine, if you will, a patient awakening after an administration of nitrous oxide and oxygen to find an abscess lanced and pus evacuated, after a week of sleepless nights and days of torture. Compare this with the methods pursued generally in these cases. Again imagine the pleasing realization of the complete preparation of three or four gingival cavities without the slightest pain, which had given you a daily reminder of their presence by even the bristles of your tooth brush coming in contact with the sensitive surfaces, and then ask yourself, ''Am I keeping up with the progress of modern surgery, or am I not allowing my medical brother to distance me in the race that benefits humanity?''

However, we must not allow our enthusiasm to overrule our better judgment. We must know what we are doing, educate ourselves into the proper manner of administration, have a thorough knowledge of what we intend doing, how we shall do it, and then proceed with dexterity, precision and self-confidence to accomplish that end. Your patient will not have confidence in you if you show hesitancy and nervousness in your procedure. If you cannot overcome these you had better let nitrous oxide and oxygen alone. As to its safety, with intelligent administration, you take about the same risk the man does who enters a public conveyance—one in three hundred thousand—making it practically harmless. Please note I say ''intelligent administration.'' An habitual drunkard or one addicted to the drug habit should never have gas. The absence of nausea, rapid elimination, and quick recovery make it the ideal anesthetic.

Dr. Thompson: I would like to ask Dr. Gregg if he doesn't sometimes find it necessary to carry the patient completely under.

Dr. H. S. Haslett: I would like to answer a statement made by Doctor Cook in opening the discussion. He said that he is not afraid of chloroform. There are a number of students of the college here, and I do not want them to get a wrong impression, as it is my aim and object all through the senior year to impress upon their minds the fact that they should be afraid of chloroform. Someone has said that he is not afraid of chloroform because he does not take the stopper out of the bottle, and that is the only way not to be afraid of this drug. We find that chloroform stands at the head, as the greatest death producer we have among drugs used for anesthetic purposes. Then comes ether, and so on down to nitrous oxide and oxygen, with not one death against it. There have been reported a total of five deaths under nitrous oxide alone, but it has never been definitely shown whether death was due directly to the effects of the gas or to a broken tooth lodging in the esophagus or trachea.

There has been a death out of every three thousand administrations of chloroform. We had a very startling case in our own city a few years ago. A physician called upon a dentist and when told what the operation would be he wanted to be given chloroform. The dentist refused to give it to him. He then said, ''If I have my father (the father was also a physician) come down and administer the chloroform, will you perform the operation?'' The dentist agreed to do so, and the father came down. The son died before the tooth was extracted.

You must not administer chloroform while the patient is sitting in the chair. It should never be administered unless the patient is lying flat on his back, with the head lower than the body, and in this position it is very hard for the dentist to perform any operations.

Another general anesthetic, which was used sometime ago to get around the use of chloroform, was A. C. E. This is another one that is laid on the shelf. I do not know whether its effects are similar to those of chloroform or of ether.

When I wish to use any general anesthetic, I prefer nitrous oxide and oxygen for cavity preparation or for longer anesthesia, somnoform. Chloroform I use quite frequently for dissolving gutta percha points and rubber, but I never use it as an anesthetic.

Dr. Wright: Is it possible to remove or extirpate pulps under nitrous oxide and oxygen anesthesia, instead of high pressure anesthesia?

Dr. W. H. Fundenberg: Elimination of pain in dental operations is something that the dental profession, all of us, have neglected to a great extent. In our earlier practice, we attempted the use of ether, chloroform and the various other drugs that have been mentioned here, and we even went so far as to try nitrous oxide without oxygen. We never went very far in the administration of this anesthetic, and we soon came back to the assistance of the family physician, and gas took a back seat in all dental operations.

When the use of nitrous oxide and oxygen first came out, there were a number of apparatuses scattered throughout the country, but the last place to be covered was the city of Pittsburg. We had the medical profession against us from the beginning in this country. We have had them against us until quite recently. This opposition was due, I am quite sure, to their ignorance of gas and its effects. They are now ready to acknowledge, however, that gas has a place in dentistry and surgery, and it is possible for the dentist today to work more successfully with the various anesthetics than in the past.

I know of no place in the country where the medical profession was so slow in coming to the use of nitrous oxide and oxygen as it was in this city. All the large hospitals in the country had apparatuses for the administration of this gas long before any of them had used it in this city, and most of the physicians did what they could to prevent its introduction. The condition of affairs in this city may be readily seen when I tell you that a physician met me on the street sometime ago and said, "Doctor, you advised one of my patients to have gas for the extraction of a tooth. Never, while I have control of a patient will I permit him to have gas used. I have seen too many people near death's door." I said, "I will not discuss the question with you," and walked away. It was simply ignorance on his part, and to argue the matter would have been useless.

Since Dr. Gregg has taken the matter up and is so strongly advocating its use strictly by the dental profession, I expect great good to result from it. I believe the doctor has the key that will open for him a big practice, and will relieve his patients wonderfully.

Dr. J. D. Whiteman: I have been waiting to hear some one say something for chloroform. It is one of the best friends I have, and I cannot sit still and listen to it being abused, as it has been an important and valuable agent in my practice. I quite agree with Dr. Haslett, Dr. Gregg and others, that chloroform has no place in our practice as a general anesthetic. It is conceded by everyone that chloroform cannot be administered safely with the patient in a sitting position. Dr. Gregg, talking of nitrous oxide and oxygen as a general anesthetic, has omitted to say that in his operating he did not try to reach complete anesthesia, as he only needs the stage of analgesia. While chloroform has no place as an anesthetic, it has as an analgesic.

I have a nitrous oxide and oxygen apparatus in my office and have used it considerably with excellent results, and have had my patients become very enthusiastic over it, but I have had them equally enthusiastic over chloroform. It works equally as well and is as safe as the gas if used in the proper way. It gives more prompt results and is more lasting, and the operator is not handicapped by the cumbersome appliance about the face during the operation. These are advantages that cannot be ignored, and then there is another matter. When I started to use nitrous oxide and oxygen, I kept an accurate record of each case, and found that it costs me about seven dollars, including expressage, for the three cylinders, and one hundred dollars tied up in the apparatus. I got six or seven administrations out of these cylinders. The best I could do was to charge one dollar for each administration, and I found that if I used it to prepare a cavity for an amalgam filling I had to charge two dollars. The result was a "sore" patient. He was "hurt" worse than he would have been had I performed the operation without the use of an anesthetic. Of course, there are some dentists whose patients do not consider the financial side of the question, but most of us have patients who will feel it. It does not cost me so much to use the gas now, about fifty cents an administration.

My method of using chloroform is as follows: I take a small bottle with a wide mouth or a small tumbler, and after placing some lint in the bottom, pour about a dram of chloroform on it. When the patient is seated in the chair I tell him that the operation is going to hurt him, but that if he so desires I will put something in his hands that will eliminate all this pain, in fact will make him have a pretty good time if he wants it. He then begins to sit up and take notice, thinking that this is funny talk for a dentist. By this time I have the chloroform poured on, and the patient begins to inhale it. "Why, that smells like chloroform," he exclaims. "I have never taken chloroform, and have always been taught to be afraid of it." "Oh, no;" I tell him. "There is nothing to fear. You will find it a most delightful sensation. I would not let anybody fill a tooth for me without it." He finally decides to let me try it, and after a few whiffs comes to the conclusion that it is quite pleasant. By that time I have opened into the cavity, and he finds that it did not hurt so much. He takes a few more breaths and I reach for my engine and continue operations, still talking to him, although by this time a dreamy, delightful sensation has crept over him and he does not notice conditions nor feel any pain. After the operation, the patient invariably declares that he thinks it is delightful, and I send him away without the least fear of ill effects.

Now, a few years ago I heard a paper read in which the author condemned the use of cocain, and advocated the use of nitrous oxide. In discussing the paper I said that I was convinced that if cocain were used properly it was perfectly safe. In closing the discussion afterwards, he said that if I continued in the use of cocain I would have trouble. That is about ten years ago, and I have had no trouble yet, although I have been using it as much as ever. Dr. Buckley yesterday said that there is a safe dose of cocain; Dr. Gregg, in his paper, states that there is a safe dose of nitrous oxide and oxygen; I am willing to go on the records of this society as saying that there is positively a safe dose of chloroform, to be administered in a sitting position, for the performance of dental operations. I can also quote from Dr. DeFord to substantiate my claim. He speaks just as highly of chloroform for the same purpose as he does of nitrous oxide and oxygen. I do not want this society to go on record as saying that they cannot use chloroform intelligently. Just as good results can be obtained from it as from anything else, and we do not have to charge the patient so much as to send him away with his feelings hurt.

Dr. W. L. Fickes: I have a few words to say in regard to this subject. Chloroform is a very dangerous drug, and the numerous deaths attributed to it should make us very careful about its use. In many cases the patient has died after a few whiffs. A drug with the record chloroform has is too dangerous to teach, especially to young men who have not had much experience.

Dr. H. E. Friesell: I want to confirm the statement made by Dr. Whiteman on the floor a few moments ago, that there is a safe dose of chloroform, and cut out a certain amount of the idea that Dr. Fickes just gave. I mention this because Dr. Fickes and I had the pleasure of spending twenty-four hours with a gentleman who uses chloroform as Dr. Whiteman explained its use. This gentleman has demonstrated the use of chloroform as an analgesic and has given clinics before the State Societies of Iowa, Nebraska and Minnesota. This man is Dr. A. C. Hewitt, of Chicago, Illinois.

Dr. Hewitt uses fresh chloroform that has been carefully protected from exposure to the light. This is placed in a wide-mouthed bottle and the patient holds the bottle below his nose and slowly inhales the fumes. Dr. Hewitt is himself the inventor of this method of using chloroform, and the first operation was upon himself. The middle finger of his right hand had to be amputated and he called in a surgeon to perform the operation. He administered the chloroform to himself and felt absolutely no pain.

A prominent physician of Pittsburg who studied this matter with me has had wonderful success with the use of chloroform in this manner for producing analgesia.

He has several times been able to keep a patient entirely free from pain during a surgical operation of an hour's duration, and not consumed over one dram of chloroform.

One of the dangers with chloroform is that it is a heavy gas and if it is poured down into a patient's lungs he may drown for want of air, just as he would drown if it were water instead of chloroform that filled his lungs. But if he breathes the vapor of the chloroform from a receptacle held lower than his nostrils, he can always get sufficient air to maintain life. The stage of anesthesia is not always necessary for a painless operation. Analgesia, which means insensibility to pain, does not mean unconsciousness. One's leg or arm may ''go to sleep,'' and be perfectly insensible to pain, but its possessor remains fully conscious. This is the condition that is produced by chloroform used as an analgesic, and it has given as much satisfaction in the hands of numerous operators as has any other anesthetic agent. When I was a student in college, with Dr. Haslett as a classmate, Dr. C. N. Peirce laid great stress upon the point of using chloroform in this manner, depending upon the experience of the operator to use it intelligently.

Have you ever stopped to think how dangerous arsenic is? And yet we use it every day. Cocain and chloroform are also dangerous, and yet if we understand how to use them and when, we will have no more trouble than with the use of arsenic. It is dangerous to use sharp instruments in the mouth, if we do not have them properly guarded—just as dangerous as the use of the drugs mentioned. These things should be used rationally, as is the case with Dr. Buckley's remedies.

You can produce loss of pain very satisfactorily with the use of chloroform in the manner Dr. Whiteman mentioned. Chloroform should be kept in a metal container, not exposed to the light, as light causes a certain change in the chloroform, and it is liable to develop some deleterious properties.

The patient should be introduced to chloroform very slowly, and we should watch when he reaches the analgesic stage. I remember my first introduction to chloroform. My preceptor sent me to the store one day to get a bottle full, as he wanted to dissolve some rubber. As I had never smelled chloroform, I was curious and took a whiff. It had the same effect upon me that would have been caused by stronger ammonia. I felt as though some one had reached up through my nasal cavity and was pulling my brain down through my nose. I have never been able to produce that effect again by chloroform. The Schneiderian membrane had suffered a violent shock. Many patients die on the first application of chloroform, and I believe they die from a similar shock. This is one of the points that Dr. Haslett mentioned, and he has made a very careful study of this subject.

Dr. Gregg, in closing the discussion, read several extracts from Dr. Ford's book on the subject of anesthesia. He then went on to say:

Dr. Hewitt, of Chicago, really introduced chloroform as an analgesic into this country, and it was done by having an operation on his toe. While the physician operated he kept himself in an analgesic stage by smelling the chloroform. He has used it in this way ever since when working for anybody who could take it, and he is the only man who has ever been successful in giving chloroform in that way. There are too many arguments against the use of chloroform in analgesic stage. Ask any physician, and he will tell you that he knows of several deaths from chloroform in the analgesic stage, which is the most dangerous stage. I remember when in college, many a time seeing them lift a patient out of the chair, stand him on his head, and do all sorts of thing to bring him to life after chloroform had been used. One day a physician administered chloroform to his own son prior to an operation. We had everything prepared for an emergency, and the boy would probably have died if we had not taken this precaution. Just as he was in the analgesic stage and the operator was going to open into the cavity, the heart stopped beating. The father threw up his hands in despair, but we went to work immediately with the restoratives at hand and brought him back to life. The father declared it was the last hypodermic for him. I want to impress upon your minds the fact that chloroform is dangerous, I do not care who says it is not; and any man who persists in its use is going to have trouble sooner or later. Young man, let it alone. What is the sense of using something that is so dangerous when you can use nitrous oxide and oxygen, which has no deaths against it?

Another thing, a good many have spoken about nitrous oxide having a death rate. Nitrous oxide and oxygen has not. There is a difference between the two. Nitrous oxide administered without air over 55 seconds causes death. Nitrous oxide and oxygen can be administered almost indefinitely. Dr. DeFord says he cannot conceive of death occurring as a result of the administration of nitrous oxide and oxygen. Dr. Cook says that the statement that few of us spend much time in our efforts to relieve pain is a hard one to take; nevertheless it is true. If we spent as much time as we do in making gold inlays and some other branches of dentistry we would understand the subject better and be able to give our patients some relief. Not five per cent. of the members of the profession do it. If we spent as much time in learning how to give an anesthetic as we do to put in porcelain inlays we would learn it. A great many come to me and say that they had a Teter outfit and had to send it back. Because they could not operate it the first time they become discouraged and decide that it is no good. If they would only take the time to study it they would learn it. When once learned it pays you for all the time you have spent in learning it.

Someone has said that the patients cannot afford to pay for it. I do not consider the expense of it at all. That is a foolish way to look at it. I would rather not charge the patient at all than do without it. Since the publication of the article in the *Dental Cosmos*, I have received letters from all over the country, the writers of which are complaining about how much it costs. I never consider the cost at all. If it is not worth that much to you, it is not worth having.

It is all right to talk about relieving pain by talking to the patient, but this is not practicable. If a patient has a sensitive tooth you cannot talk the pain away. It is all right to talk to get the confidence of the patient, but pain cannot be relieved in that way. In tying a ligature around the gum, if we will go to the trouble to put a little cocain around the gum, we can relieve it. ''Delicate touch'' is all right, but how are you going to cut out a sensitive tooth with delicate touch? Cannot even touch the tooth without the patient wincing. We must produce pain to relieve pain.

Dr. Thompson spoke of its being necessary to carry the anesthetic to a complete stage, with some patients. In most cases I find I can do the operating without doing this, but if the patient becomes anxious I put him completely out. If the patient does not care, you do not need to care. You do not need to be afraid of the consequences, whether awake or asleep. Watch the lips, and as long as they do not turn blue it is all right. When a nervous woman comes into the office with a sensitive tooth, I tell her I can relieve her from all pain during the operation if she so desires; it is up to her, as it does not hurt me any. Do not scare the patient to death before beginning the administration.

I want to pat Dr. Haslett on the back for what he says about chloroform: ''Be afraid of chloroform.'' You are right to be afraid of it.

Dr. Wright asks if it is possible to extirpate pulps under nitrous oxide and oxygen anesthesia, instead of high pressure anesthesia. There are a good many cases where we can do this, but I am afraid to do it for fear of hurting the patient. I therefore very seldom try to use it to take out pulps.

Dr. Funderberg spoke about the ignorance of the average physician on the subject of nitrous oxide and oxygen anesthesia. I am glad he brought this point out. However, we are glad to say that their opposition is subsiding, and quite a number of them have an outfit of their own. Now the hospitals are getting interested, and I have administered nitrous oxide and oxygen for operations in both the St. Francis and Allegheny General Hospitals, with great satisfaction to both the patients and the operating physicians. They have an outfit in each of these institutions.

PREVENTIVE AND RESCUE TREATMENT OF THE MOUTH*

By N. S. Hoff, D. D. S., Ann Arbor, Mich.

(*Continued from January Summary, Page* 40)

DISCUSSION.

Dr. C. M. Wright: I want to thank Dr. Hoff for his patiently worked out paper on Prevention and Rescue (good terms). He reviews two prominent diseases of the mouth which we dentists are called upon almost hourly to treat, viz: dental caries, and what he has termed "Peridentitis." The name peridentitis is a good one, for the disease to which he applies it is an inflammation, an "itis," and its location is about a tooth or teeth—peri and dent, "pericdent."

Everybody knows that inflammation is not a simple disease, with but one phase, and occurring in but one tissue. It is a series, or succession of changes: First, in the circulation of the blood in and about the injured part; an accelerated flow of blood through dilating blood vessels to the part is the first change, this flow showing gradual retardation in these distended vessels, which in a little while is followed by a stasis, or complete stoppage of the flow. In the meanwhile, exudation from the capillaries is increased; first, in quantity, and finally in quality. We have constantly, before injury to any tissue, a normal or physiological exudation of lymph, supplying food to every tissue cell of every tissue; to muscle, nerve, bone, dentine. Secondly, we have an hyperemic exudate which gradually increases in quantity; and thirdly, we have the different inflammatory exudates, loaded with albumen, and fibrin forming substances. Fourthly, the white cells or leucocytes develop a tendency to cling to the endothelial lining of the blood vessels. There seems to develop in the pavement-like cells of the intima, a stickiness, or a "positive" chemotaxic property which draws the white cells of the blood to the periphery of the blood streams and makes them cling to the vessel walls, through which they finally creep, by ameboidal movements, and float in the flood of exudates, which bathes the now softening tissues on the outside of the capillaries. (The red corpuscles, too, wander through the walls and enter the tissues). A high state of metabolic excitement becomes evident in the neighboring tissue cells, increasing the waste which accumulates in the inflamed area.

All the changes, excepting this extra quantity of waste, so far, are regarded by the surgeon as benign in intention; as a natural and proper reaction for defense, and later for repair of the injury done to live tissues by a mechanical irritant, such as for instance, his lancet or knife; and of a chemical, corroding irritant, and of a bacterial or living irritant which invades the territory—sets up housekeeping, and expects to live off the original live tenants of the tissues, namely the cells and their products—the intercellular substances.

In favorable cases all this activity shows a method of protection, prevention, and reclaiming, by a property or power inherent in healthy tissue cells.

Chronic inflammation of a part gives evidence of continued existence of the irritant and persistent destruction of neighboring tissue, or a necrobiosis affecting soft and hard tissue. On the other hand, greater struggles on the part of contiguous tissues continue, with evidences of frequent defeat of these efforts. The physician and surgeon (the oral surgeon as well), to be useful, must enlist on the side of the tissue, and by his surgery remove the irritant; whether it is serum tartar, fermenting substances, or pyogenic bacteria and their waste, and second, to protect and soothe the cells which will in their own time and way, proceed to repair damages and rebuild broken down places. The surgeon cannot do this repairing. He can't make new bone, or skin or membrane. The real surgeon and physician helps the live cells. The unwise surgeon or physician, by not knowing when to stop interfering, may prove as much of an enemy as a savage horde of cocci.

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*Read before the Odontological Society at Cincinnati, 1910.

On the whole then, I like Dr. Hoff's plain name for this trouble,—meaning an inflammation around a tooth. I also like Dr. Fletcher's name for it, "Alveolitis." Both are good and appropriate terms under which each phase may be grouped and classified. Dr. Rehwinkel evidently gave the name "Pyorrhea Alveolaris" to the one prominent stage which he studied. There must be something in the sound of this name which rapidly attracted and fascinated our profession, both in this and in foreign countries, for I believe it is almost universally employed, as appropriate to this "itis," this *inflammation in the tissues about a tooth.*

I am pleased with Dr. Hoff's separation of the phases, or stages of this inflammation, into four definite classes, and while I should draw a line about a condition which we recognize (though not inflammatory) as dependent or caused by malnutrition of the parts, and should define it as *atrophy* of peridental tissues, Dr. Hoff may be right in not considering it in his paper; unless he includes it in the fourth class, as gangrenous, There appears to be in this disease or phase of the disease, a numerical reduction of the cells and a diminution of inter-cellular fibres with a pronounced anaemia in the peridental tissues that should appeal to our prophylaxis, and to our therapy.

Take the paper as a whole, I don't believe a critical sieve through which one might want to squeeze every statement made on this subject, would be a good or necessary thing for this excellent paper,—for it is a good working manual.

Now about methods of prophylaxis and of cure and rescue, surgical and manipulative; every man either follows in his own practice what he has learned from the clinics of some forcible man, without looking closely into the pathology of his cases; *or* he forms a theory about the pathology of the local tissues and adapts his treatment to his notions about the tissue changes.

Of course the basis of each in practice is: First, to find and remove the local irritant, *and try to find an obscure systemic cause,* one which lessens the resisting power of these gingival tissues to irritants. Second, after thorough removal of the local irritant (and Dr. Hoff has beautifully given the details of this surgical work), he tries to encourage the tissue cells to do their natural work of restoration and regeneration. Various medicaments have been and are applied to the wounds which we make in our minute minor surgery of the parts, hoping to protect the parts and encourage granulation of the surface and the filling up of the pockets. Personally, I have employed at this stage, Balsam Peru with gratifying results,—making fresh applications at frequent intervals without disturbing the newly formed and forming, bud-like granules, which we must depend upon to heal wounds and to restore lost tissue by replacing it for the time being with scar tissue,—which may be likened to a reorganizing granulated tissue. Another technical or surgical method which I employ to a considerable degree in certain hyperamic, or tumified or hypertrophic conditions of the margins of the gums, is to snip off excess of tissue with small curved pointed scissors. A contracting scar tissue is the result awaited, which seems favorable to the final restoration of these margins. Obliteration of ugly "pockets" can also be made with these scissors by slitting and making a different shaped (a more open) wound. This is an advantage; first, in facilitating the removal of irritants, and second, in leaving a better shaped wound, with less opportunity for septic matter to be retained.

M. H. **Fletcher**, Cincinnati: I am very much pleased with the presentation of this subject. To me it is one of the most scientific presentations I have heard, particularly as to the prophylactic part, but here I wish to leave this portion and speak of the part where I differ in opinion with the essayist.

His nomenclature is in accord with practical and scientific naming of diseases in other parts of the body; that is, if the essayist describes the real pathology. His classification enables us to talk of the disease in its different stages, instead of talking of it, as we now do, calling it by one of its symptoms.

Every disease has its beginning, and if not arrested, goes through all its stages to its climax and its ending.

With a foundation or generic name such as the essayist has given, the disease can be fairly described in any of its stages, its suppurative stage being what is now called Pyorrhoea Alveolaris.

But my own conception of the disease goes a step farther than the essayist. I look upon it as fundamentally a bone disease, hence I would give it a different generic name and call it "Alveolitis," because it seems to me that diseased alveolar process and ultimately, in many cases, the cancellous portion of the maxillary bones is the underlying factor. The initial or primary lesion is necessarily in the gum tissue about the necks of the teeth (here please distinguish between initial or primary lesion and primary disease). The bone soon becomes involved after the start in the gums, and this must be very early in the progress of the disease, for in perfectly normal healthy gums, in young teeth, the distance from the saliva line to the margin of the alveolar process is not greater than a sixteenth to a quarter of an inch, and when this distance is passed the bone becomes the larger and primary factor.

It must be remembered that the alveolar process near the neck of the teeth is thin like the finger nail, and is easily destroyed when constantly bathed in the products of an inflamed gum, especially if suppuration appears at this stage, but even a chronic stage of inflammation of the gums almost immediately begins to affect this thin bone.

At this stage both the flesh and bone are in an especially favorable condition to become infected by bacteria. The bone once infected is not so able to throw off disease as is the flesh. It is an unquestioned fact of anatomy that the gums are dependent upon the underlying bone for their nourishment and health, hence when the alveolar process is diseased the overlying gums must partake of this disease. The reverse is also true, that when the alveolar process is normal and healthy, the overlying gums are also healthy. The exceptions to this are from eruptive diseases, or those that affect the glands of the mucous membrane, but these disorders recover by suitable systemic or local treatment. However, the disease under discussion only recovers after the bone is well. The treatment of the operator may not be consciously directed to the end that the bone must first heal, but the laws of repair teach us that this is what must occur.

It seems to be agreed that all deposits must be removed from the roots. In a large percentage of cases this is all that is necessary in order to allow nature to re-establish health of the parts—a thing she is always trying to do, and will ultimately accomplish by removal of the alveolar process and the tooth. When the tooth is out, the underlying bone recovers and becomes covered with healthy gums. On the other hand, no amount of treatment of the gums pure and simple, would induce a case to heal. These facts alone would indicate to me that the alveolar process is the real seat of the disease after the initial lesion in the gums, hence the name Alveolitis, but the name is a secondary matter; it is the real pathology we wish to know. The term Alveolitis indicates, however, the locality and the kind and particular tissue principally involved. The ending "Itis" indicates inflammation in this tissue and its surroundings. Whereas, in the essayist's term "Peridentitis"—"Peri" means around and "dentis" means tooth—"Itis" means inflammation. This literally translated means "Around the tooth inflammation," and does not indicate a definite tissue, but any and all tissues about the teeth. No other disease of the body which I can recall, carries such a name. Such names as "Ostitis," "Pleuritis," "Conjunctivitis," "Periostitis," all indicate local diseases of a definite tissue, and in each case, from continuity, the surrounding tissues are involved and inflamed just as they are in Alveolitis; yet no one thinks of saying "Peripleuritis" or "Periconjunctivitis" because the surrounding tissues are involved. The generic name is given to the tissue primarily involved, no matter what started the inflammation, every one knowing that when the primary tissue or organ is restored to health, or the exciting cause is removed, that inflammation in the surrounding tissue always disappears.

The name Alveolitis admits of any specific description that any one may need to use in talking of or describing any phase or stage of the disease or the surrounding tissues.

I would make four arbitrary divisions in describing the disease, viz: Primary, Chronic, Suppurative and Necrotic Alveolitis, all such divisions in any disease must be arbitrary since no symptom is sharply defined from the others. After the exciting or initial stage in alveolitis, as above described, any or all symptoms may exist at once, but usually occur in the order given. Other divisions may be better than these since the necrotic and suppurative stages are necessarily a chronic condition, but these four stages may be defined as follows:

SIMPLE ALVEOLITIS

Simple alveolitis includes the beginning of the disease in the flesh about the neck of the tooth from an irritant, usually tartar. This is the initial or primary lesion. This irritant causes inflammation. The inflammation is nature's effort to protect or repair. If the inflammation is allowed to continue it reaches the edge of the alveolar process in a few days or weeks, and without doubt the thin edge of the process begins to be absorbed as a result of the inflammation. If the irritant is not removed, the destruction of the alveolar process continues until the overlying gums become more deeply inflamed and take on a chronic or blue appearance which indicates the beginning of chronic alveolitis.

By far the largest number of cases come under Simple Alveolitis, far outnumbering all the others.

We all see many cases where quantities of tartar exist and have done so for years, yet neither the bone nor the flesh are inflamed to any depth, probably not over one-sixteenth or one-quarter of an inch beyond the irritant. When the tartar is removed both gums and bone promptly get well.

Many persons with quantities of tartar go through a life-time without the loss of a tooth from this cause, and without inconvenience or pain. The fact is, a very small percentage of the people ever have their ''gums treated,'' and yet a very large percentage of them have what is known as ''good teeth'' to their dying day.

CHRONIC ALVEOLITIS

I would describe Chronic Alveolitis (omitting the histology) as that stage showing dissolution of the bone, the probable result of infection. This infection may be from one or from several of the various kinds of pathogenic germs that constantly inhabit the mouth. In an unclean mouth a very large variety exists, any of these finding suitable environment for growth and multiplication may start their colonies. Suitable environment may be the sore places about the necks of the teeth where open blood vessels and diseased bone are plentiful. Every adult has more or less tartar, consequently is in danger of such infection and absorption, especially when from disease or otherwise the opsonic or protective index of the blood is low. The alveolar process is usually the seat of the infection, if infection is what it be, since the environment in the bone is more suitable to their protection and growth than flesh. The infection may be such as pus, syphilitic or tubercular, but in any event we know the alveolar process is slowly destroyed; it may be by osteoclasts excited by bacteria or other causes of inflammation. But these questions must be determined by careful laboratory experiments.

I do not believe, however, in any specific germ as the cause of this disease, as some have suggested.

SUPPURATIVE ALVEOLITIS

The physical symptom of the disease in this stage is pockets on one or more sides of the roots, accompanied with pus, constituting Suppurative Alveolitis—("Pyorrhoea Alveolaris").

With certain infections and particular individuals where resisting power is weak, it needs only a start for the destructive process in the bone to be continued; this may proceed without farther deposits on the root. Finding a flow of pus and the roots free from deposits, has caused some of our practitioners to say "Tartar has nothing to do with the disease." I would refer such to a study of bacteriology. The necessary conditions for inoculation, and the effects and results osteoclasts and bacteria may have upon any pabulum upon which they may flourish, like some evidently can in the alveolar process.

The growth of tubercular germs is usually not accompanied with pus, but they penetrate deeply into the cancellous bone when once they have a foothold. Whatever the details of the process may be, the destruction often goes quite beyond the apices of the teeth, producing what I would call Carious or Necrotic Alveolitis.

NECROTIC ALVEOLITIS

Aside from the beginning of the initial stage, dead bone may be found in all stages of this disease, but the quantity is so small in the initial stage that it is not easily perceived, and disappears when the irritants are removed. The deep-seated suppurative and necrotic stages are most difficult to handle in the treatment. But in all cases, if it be possible to remove all irritants such as calcareous deposits and dead bone, at the same time preventing suppuration, these wounds will heal as readily as other bone diseases treated the same way. This removal is easy for the operator to think of, but not easy for him to accomplish in all cases.

It is a well known fact that when diseased bone is found in any part of the body, the overlying flesh, be it what it may, also becomes diseased, the thinner the tissue over the bone the more quickly is the flesh broken down. I see no reason why we should not recognize these conditions in the mouth the same as is done elsewhere, since the laws of pathology are the same in the mouth as they are in all other parts of the body.

The removal of calcareous deposits from the teeth and roots, in most cases, results in final recovery which remains permanent if the deposit is prevented from again accumulating. But the rational and accepted treatment for suppurative and necrotic bone is the same here as in other parts of the body; that is, in addition to removing deposits, remove the dead and diseased bone because by so doing, recovery is hastened.

Following this reasoning and established practice, in surgery, I, in many cases, cut away with bone bur or curette such dead or diseased bone and cementum as can be detected. And also cut away more or less healthy bone which seems to result to the advantage of the healing process.

It is a fact easily recognized that when flesh is diseased in consequence of underlying diseased bone, the flesh heals as soon or sooner than the bone, after an operation, and it is this law of disease and repair which leads me to believe that the bone is the primary factor in this disease, and is why I would substitute the definite name "Alveolitis," rather than use the indefinite name "Peridentitis." Although as before stated, the essayist has taken a great step forward in the way of scientific nomenclature in his suggestion, that is, providing his conception of the pathology is correct.

A more detailed description of my reasoning on the subject can be found in a paper on Alveolitis, read in June, 1908, at Chicago and Indianapolis, and published in the *Journal of the American Medical Association*, issue of December 19, 1908, and in THE DENTAL SUMMARY of Jan., Feb., March and April of 1909.

DR. F. A. HUNTER, Cincinnati: "I esteem it a great privilege to have listened to such a paper as that read tonight. It is the most complete exposition of the subject that I ever listened to or ever read. In the classification of the different phases of the disease. Dr. Hoff has presented a paper that we have never had before. When, in the past, we have been talking of what we called pyorrhea, we talked it over with each other, some claiming that it was curable; others claiming it is not curable. We talked it over and each dentist had in his mind a particular phase that was different from the phase in the mind of his opponent. Dr. Hoff has classified it and has given the treatment in the different phases of the disease. The first phase can be called simply a deposit of salivary calculus. This phase some dentists call pyorrhea, which is amenable to treatment, and when you get through the surgical treatment, it is cured. But the other phases of the disease are a different proposition.

J. S. Cassidy, Covington, Ky.: I have enjoyed this evening very much in meeting my old friend, Dr. Hoff, who, as you all know, is one of our boys who has reached the top of the ladder and who does not look down upon us with contempt. I have enjoyed also his paper, more so, perhaps, than any paper I have listened to for a long time. It is monumental in its construction; it is a classic on the subject he has taken up. I would not dare to criticize the discussions of my friends Drs. Wright and Fletcher, as I have not come prepared as they have. I agree with Dr. Fletcher in stating that the benefit of medicine in such cases is not so much as the benefit of the surgical work, but given under the method Dr. Hoff has worked out, would be a great aid.

Dr. Schott's allusion to the possible irritating gummy deposits from Tincture of Myrrh is well worth considering, but it seems to me that the gum in the tincture is so completely dissolved by the alcohol, that its slight precipitation in the part could not cause a nidus of irritation.

According to accepted rules of chemical valency, there can be no such thing as ammonium bifluorid ($N H_4 F_2$), and therefore I am led to suppose that Dr. Head's preparation consists of ammonium fluorid ($N H_4 F$) and free hydrofluoric acid, and if such be the fact, careless handling of the drug must be dangerous.

In the last number of the *Dental Cosmos*, Dr. Bowman, of Springfield, Ill., states that he places a small quantity of the liquid *tartar solvent* in a little wax cup, and after several hours of exposure he finds a crystalline residue. These crystals so freed from acid, are doubtless normal ammonium fluorid, nearly neutral. He takes up on a moist quill a crystal of suitable size and inserts as far as possible into the pocket, where it dissolves by the native moisture. It probably reacts by giving up its active principle molecularly, thus insuring safety; and in Dr. Bowman's practice it not only disintegrates the deposits on the root, but also acts directly therapeutically, curing in a most remarkable manner many apparently hopeless cases.

Dr. Sweny, Cincinnati, O.: I simply wish to express my pleasure for this most excellent paper of Dr. Hoff's this evening. It certainly is truly characteristic of the man—careful, painstaking, exhaustive and scientific. I feel we ought to be congratulated in having him with us. There is one point in the paper I think needs special reference and that is in regard to the care of children's teeth from two years of age, on. We are now right in the infancy of prophylaxis. I think if we could have the care of the children's teeth at that time we could conserve their usefulness much longer. Now I know it is very hard for us to do this, but this will be a part of our work, and the time is not far distant when we shall use this preventive treatment more extensively. I certainly think we should be congratulated on having Dr. Hoff here this evening.

Dr. Hoff, in closing: I am greatly obliged to Dr. Wright for his specific description of the inflammatory process in the peridental tissues, as it gives point to this treatment. I believe we have made too much use of the escharotic remedies, which together with clumsy surgical treatments, often repeated, because never thorough, have resulted in excessive loss of the supporting root tissues. I am therefore greatly pleased to have Dr. Wright's testimony to confirm my own ideas in this respect.

I do not quite understand how Dr. Fletcher can classify this class of disease all under the one head of alveolitis, unless he believes it always a bone disease in inception or association. As I view it there are some stages where the bone affection is slight, if any, and a sequential rather than a primary incident. Neither can I see how the cancellous bone must always be the underlying factor, except where the disease has made so much progress as to bring about bone dissolution, even then it is generally of a carious or ulcerative type rather than interstitial. Of course it may be associated with a specific bone affection and therefore logical, but have not so considered it.

In regard to the name peridentitis, I am not sure that I am fully justified, but I have used this name to classify treatment which I have found so unsystematic and vagarious that no intelligent discussion of the therapeutics of the disease was possible. Dr. Fletcher's similes, it seems to me, are hardly pertinent, as we do not have the same complication of structures in the plura and conjuntiva. In peridentitis the root of the tooth is not the seat of the disease and generally is not involved; it is the peridental structures that suffer, not the alveolus alone. The peridental membrane, the gum tissue, periosteum and alveolus may all be involved. If the bone was the only structure affected it would be easy for me to call it alveolitis. The only point of difference I can make with his classification is as to the origin of the disease. I can't see it as a primary bone infection, and am not convinced that the alveolus is always involved. In fact, in the necrotic form of the disease there is but slight bone affection, except in the late stages when the stability of the root's position is impaired.

In reply to Dr. Schott, I would say that I have not used the oxid of tin and silex, as I find pumice sufficiently abrasive for my purpose. I use the myrrh well diluted and in connection with proper brushing of the teeth by the patient I don't think you will find it detrimental in the respect you mention.

I surely appreciate the many kind expressions that have been uttered this evening. I do not consider myself an authority on this subject. I have worked diligently at it clinically for the past three or four years and have made such progress in what I consider successful treatment that my friends call me an enthusiast, and when my friend Callahan invited me to come back home and address this society, which I helped to organize and which contains many of my dear friends, I thought I could not bring to you anything except that which was nearest to my own heart. I trust you were not fatigued by my long and tedious descriptions, and that I may have brought you some thought that shall give you a new inspiration.

COMBINATION FILLINGS*

By Dr. Frank H. Field, New Orleans, La.

THAT the combination of base metals of various kinds in direct contact with gold in filling teeth has a beneficial effect on tooth substance has long been recognized. An experience of many years in the use of such fillings has convinced me that there are no better ways of filling teeth of soft structure, where the presence of the base metal does not mar the esthetic result of the work.

My attention was first called to the good results of this method of filling teeth by combining gold and base metals, some eighteen years ago, by Dr. C. Edmund Kells, Jr., who showed me fillings he had inserted many years previous in the teeth of poor structure, that showed unmistakably the beneficial effect in preserving the teeth from recurrent decay. The most common location for this kind of filling is in approximal cavities in bicuspids and molars.

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*Read before the Louisiana State Dental Society, 1910.

Many of such cavities are much better filled with combination fillings than with gold inlays, for the reason that so often the decay in approximal cavities extends so far, both lingually and buccally, at the gingival border, that to prepare the cavity properly for a gold inlay calls for the sacrifice of so large an amount of tooth substance, that the preparation of the cavity at these important points is apt to be slighted and softened, dentine and enamel allowed to remain to quickly cause recurrent decay at the base of the inlay filling. Also, if the decay extends to below the gum line, the wax impression of this part of the cavity is apt to be very imperfect; while on the contrary, no matter what the condition of this part, it can be more thoroughly repaired and filled with amalgam than any other filling.

While amalgam is the best filling for the gingival part of the cavity, it is not as good as gold for the grinding surface, and where edge strength is called for at the approximo-occlusal angles of the cavity. The principal reason for the use of the combination fillings in any location is the beneficial effect often derived from the presence of gold and a base metal in direct contact with each other in the cavity. What causes this good effect I am unable to say. Whether it is a chemical or an electrical phenomena that brings about a condition of immunity to further decay, I cannot tell you. It is to me simply a case of "by their fruits ye shall know them;" and when after years of observation of such fillings in my own practice I see less of recurrent decay from the combination fillings than from the all gold or all amalgam ones, I am convinced that we are doing the best for our patients when we fill their teeth in this manner.

In preparing for such a filling, the cavity should be extended for prevention by cutting the buccal and lingual until self-cleansing edges of the cavity are secured. The cavity must be cut until sound tooth substance is secured for the base, which must be cut at right angles to the axis of the tooth. Sufficient undercuts should be made on buccal and lingual sides to secure a firm anchorage. The edges of side walls cut square, not beveled. If the tooth to be filled has a large cavity and live nerve, my practice is to use as a capping and cavity lining, pustolene taken from the last half of the container it comes in, as by that time the excess of moisture in it has dried and it is of the right consistency to handle without smearing over the cavity. This is placed in the part of the cavity where we usually put cement lining, which should be used if the pustolene is not.

I use the pustolene because it is a good non-conductor, is never irritating, on the contrary has a soothing, anodyne effect on sensitive dentine, and is permanently antiseptic, and it is not necessary to wait at all for it to harden before putting in the amalgam. The pustolene in place, and any large excess near the sides or base removed, the amalgam is then inserted and pressed to all parts of the cavity with ball burnisher instruments of proper size for the cavity being filled. The matrix does not enter as a factor with me in inserting amalgam fillings in approximal cavities.

The method I use is as follows: As stated above the amalgam is pressed with force sufficient into all parts of the cavity. Then it is *built out until it is a mass extending to the adjoining tooth,* which you will see acts as a matrix to hold it in place until the contour is secured. While the amalgam is still stiff, a single strand of the grass that grass rope is made of, if forced between the amalgam and the adjoining tooth by a sawing motion, to remove the contour, and approximal contact point of the amalgam part of the filling. The use of the single strand or fibre of grass for this purpose is because of the strength it has in so small a piece, and because it is more flat than round, as a string, or floss silk is, and a piece of silk, or any other means that I am aware of, would cause the removal of too much of the amalgam at just the place where we want it to remain, the approximal contact point.

The contact point can often be secured in this way without separating the teeth by wedging. The pieces of amalgam that the grass cuts from the filling can be removed with suitable instruments. I use for this purpose a good deal a Donaldson Bristle.

The amalgam is built up to near the grinding surface, leaving unfilled the part to be filled at a subsequent sitting with gold. At the next sitting the amalgam is polished on the approximal surface and at the gingival border. To do this may require sometimes the use of a rapid separator to gain a little space so as not to destroy the approximal contact point.

When preparing for the gold fillings, the amalgam is cut away enough to give sufficient body to the gold. It is well to always extend the cavity to include the coronal fissure so as to have good anchorage for the gold. The rubber dam is applied, a matrix of this metal put between the teeth, and cohesive gold used for the filling. In rendering the bill, a charge is made for each filling the same as though they were in separate teeth.

In approximal cavities where the walls can be made parallel, or nearly so, a combination filling of tin and gold can be inserted at one sitting.

The walls and base of cavity are cut square with slight undercuts enough to hold the tin. The rubber dam is applied, and a matrix made of a wedge made from a piece of orange or hickory wood, trimmed so as to be widest at the gum line, and cut to a feather edge toward the contact point. I use this kind of a matrix because it forces the tin to take the shape of the contour at this part of the tooth, and I feel more certain of having perfectly condensed contact of filling with tooth walls than if a matrix reaching to the grinding surface were used, which would prevent seeing what was being done when filling this most important part of the cavity. The wedge in place, two cylinders of tin of the right size are placed side by side in the bottom of the cavity and malleted to place and condensed, a foot plugger being used. The gold is then added to the tin, and the filling finished as would be done if no tin were used. When the gold is built up to the top of the wedge, a matrix for the rest of the work is made of a thin piece of metal, which is sometimes put in while the wooden wedge remains, or the wood can be removed and the metal only from the matrix. A matrix of this kind enables us to be certain that the filling is condensed at all surfaces.

In cavities on the grinding surfaces, prepare them with inverted cone burs. In filling with tin and gold take a cylinder of tin, place it against the distal wall and with a foot plugger mallet it solidly to place, then add cohesive gold until the cavity is full. This can be frequently done without the use of the rubber dam, by using napkins in the proper way.

Cavities on buccal surfaces can be filled often in the same way as just described, if not too large. If large, use cylinders of tin and cylinders of gold, inserted with cylinder instruments. Or use a large cylinder of gold in distal part of cavity, mallet to place with foot plugger, and finish with amalgam, polishing at a subsequent sitting.

Frequently large distal cavities in cuspids can be filled by putting the gold in first by hand pressure in the labial side of the cavity, using enough to prevent the amalgam causing the tooth to show discoloration, through the thin enamel, then finishing with amalgam and polishing next sitting.

Combination fillings of amalgam and cement put in while both are soft, I have never used. I would like to know the experience of some who have used that kind of filling.

NEURASTHENIA IN DENTAL PRACTICE*

By Adolph Bernard, D. D S., Morgan City, La.

THE term Neurasthenia (nervousness and nervous debility) embraces too many and too varied physical and pathological conditions as generally accepted at the present time to receive general consideration in the limited scope of a paper on a dental subject, and in view of the many and complicated, as well as complex conditions associated with many phases that are little understood in the study of nervous disorders, your essayist will not attempt to discuss this condition any further than is related to, and concerned in, the practice of dentistry.

In our special and limited sphere of activity, as dentists, the fundamental causes and origin of this particular trouble, so frequently and almost universally found due to organic lesions, would seem to end with a presentation of the patient in a state of nervousness so profound as to leave no doubt as to the existence of such trouble, but this is not all; the source which is usually so profound and deep-seated must be found, therefore the resourcefulness of the operator will be called into requisition in the search for organic lesion or lesions productive of neurasthenia.

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*Read before the Louisiana State Dental Society, 1910.

Diagnosis, as far as the dental practitioner is concerned, is comparitively easy and simple, for there is no chance of mistaking a case which is so characteristic in the shape of unrest, great fear, distrust, prostration, insomnia, iritability and the whole train of symptoms that so often interferes with a sucessful operation at the hands of a dentist. But as previously mentioned, the case does not rest with a diagnosis, the etiology must next be found and it is these conditions and causes that have suggested these observations.

At first thought, it would seem that in so far as any organic or deep seated pathological derangement of the nervous system is concerned, that the matter would rest with a reference of the case to a competent medical practitioner and then await the results to follow. This in most cases may be easily done and has been done by the essayist with gratifying results, but there are many exceptions to this rule in cases where the dental practitioner is from the country, as the family physician is so accustomed to attending only to immediate affections, such as fevers, and emergency surgery, that he does not care to look into the more important organic conditions that would and should appeal to his care. And again he is very prone to resent the invasions of the "Tooth Carpenter", as we are considered and generally known by them in the country, into his field of activity by telling him that he has failed to recognize a defective liver circulation or a non-secretory apparatus of the kidneys, to say nothing of the fact that he had forgotten that the father of the child had syphilis a few years ago.

It is where these conditions occur that our usefulness to ourselves as well as to our patients comes in and it is with these conditions in view that we will take up for discussion some of the more important organic disturbances which contribute to the production of nervousness.

In this connection will be mentioned the liver and kidneys, the bowels, the stomach, and in the case of females is added ovarian and uterine disorders, to which is added in both males and females, diseases of a hereditary type, very commonly met in dentistry and which taxes the resources of the dentist to successfully meet and treat, for it is not only that the hereditary ailments are active forces in aid to the development of neurasthenia, but are in themselves most energetic enemies to general health, which is so necessary for the maintenance of healthy organs of the mouth. But these will not be treated here, being sufficient in themselves for a full paper.

As to the organs most frequently found unhealthy, which if properly treated will relieve or palliate many cases of severe neurasthenia may be mentioned the liver and kidneys and in cases of females, the ovaries and uterus.

THE LIVER

Defective metabolic functions of the liver are usually recognized by a condition of biliary pigmentation of the skin associated with jaundice of the sclera, the eyes and skin, frequently accompanied by constipation, indigestion, fulness about the chest, lack of appetite, headaches and vertigo. The jaundiced conditions above mentioned are usually sufficient for a diagnosis of liver complaint.

THE KIDNEYS

Disturbances of the functional activities of the kidneys may be recognized by the eyes, there being a characteristic white color to the blood vessels of the eye and the patient presents general signs of malnutrition. On questioning the patient it is found that the urine is scant and thick in some cases and in others it is thin and profuse. Examination will disclose albumin or sugar and the uratic salts, uric acid, etc.

In case of the liver, whenever it is possible to make a diagnosis of a derangement of the metabolic processes of this organ the first step to be taken towards relief is small doses of calomel repeated at frequent intervals, usually in doses of one-fourth grain combined with one-twelfth grain podophyllin and one- eighth grain aloin and one-half grain ipecac given three times a week. Of course, in cases of malaria, recognized by large flabby tongue with indentations on the sides, large doses of calomel must be given; at least eight grains, combined with soda and then followed by a course of saline laxatives for quite a few days. Phosphate of soda and sulfate of magnesia can be used to advantage. Again, your writer has had very good success with Cooper's Mineral Well Water, Blue Lick Springs Water, Tate Springs, as well as the many other watering resorts in the various parts of the country, notably Hot Springs, Ark., and Mineral Wells, Tex., and Sulphur Springs in Virginia. Diluted Nitro Mur. Acid, 10-drop doses. The glycerin phosphates of lime and soda may be used to advantage, combined with strychnia, in cases where there is an indication of lack of nutrition. This is a good practice at all times as a nerve treatment.

Whenever it is desirous to treat the kidneys, as far as the dentist is concerned, if there be marked disturbances of the functional activities of this organ, it is always best to flush them with the stimulating nephritic agents such as the various mineral waters, among which may be mentioned Celestin Vichy, and Stafford's Mineral Water, the various Lithia waters, including the Lithia tablets of five grains each, that are to be had on the market. The drugs that may be employed are San Palmetto Corn Silk Pariera Brava, Juniper berries, buchu. A nice pharmaceutical preparation to be used is the elixir of San Palmetto compound, composed of San Palmetto, juniper berries, corn silk and oil of sandalwood, given in doses of a tablespoonful, three times a day.

THE STOMACH AND BOWELS

In these cases palliatives simply are indicated. Subnitrate of Bismuth, Naphtholate of Bismuth, Pepsin, Pancreatin and Rhubarb, to which may be added the opium compounds when it is desirous of arresting peristalsis.

OVARIES AND UTERUS

These organs are not frequently treated by the dentist, in fact, it is not usually his sphere to make such a diagnosis, but it sometimes happens that the patient mentions that there is organic disturbances of various kinds, including lacerated uterus, ovarian troubles, etc. The viburnum preparations in conjunction with codeine sulfat may be given with good results, viburnum opulus thirty grs., codeine sulfat one-half gr. per dose.

These are the most difficult cases to diagnose and treat, as it is very difficult to get a correct history from the patient. However, there are certain physical conditions that are very diagnostic of certain ailments, such as Hutchinson's teeth, inflammation of the lymphatics all over the body, glanditis, rheumatism, neuralgia, etc., are signs of hereditary as well as aquired syphilis, and should be treated with the iodides of mercury and potassium. The liver and kidneys must be watched in these cases.

Materia medica and therapeutics should never be lost sight of in the management of neurasthenia, but it should be borne in mind that other means are available and quite effective and may be employed to advantage, viz. "*SUGGESTION*" (this will be handled under citation of cases). Electricity and hydro-therapy. Of these electricity is mostly used as a form of suggestion only, but as to the hot and cold water baths and particularly the cold ones, the therapeutical effect is usually very good.

CASES

Case A. Mrs. H. presented herself for dental attention, suffering with a chronic pericementitis, due to infection induced by alveolar abscesses on several roots, also a gingivitis and a general infection of the mouth. Her general physical condition had unmistakable indications of malnutrition, and a highly developed state of neurasthenia, probably from organic sources. She suffered constantly from fear and unrest, as well as insomnia, had rhythmical hysteria and was easily irritated. She had a terrible dread of the dentist and the physician. She expressed a desire to take a general anesthetic for the extraction of her teeth. She was given the glycero phosphates of lime, potash and soda with strychnia, and the bromides, in preparation for the administration of the anesthetic, and ordered to return in three days, but at which time she was found still unimproved, too nervous to permit of the taking of nitrous oxide gas. She was then referred to a very competent physician who diagnosed the case as nephritis and a floating kidney. The patient remained under the care of the physician for about three months, after which, on presentation, her condition had so improved that it was not necessary to give the anesthetic for the extraction of the roots.

Case B. Mr. B., age about 35 years, very nervous, irritable and distrustful; did not sleep well and showed signs of weakness. Though not many signs of malnutrition, would not permit of any kind of dental operation. This case was also referred to a good physician who made a diagnosis of a sclerotic condition of his liver due to alcohol. After proper treatment for ten days it was possible to insert large gold fillings for the patient without any signs of nervousness.

Case C—Miss G., a young girl, about 12 years, suffering with the whole train of neurasthenic symptoms was sent to me for dental treatment, but as in most of these cases very little at first could be done. She had symptoms of hereditary syphilis, a peculiar condition of the eyes called my attention and on scrutiny I found that there was a marked disturbance of these organs. I then brought her to an oculist in New Orleans who adjusted proper eye glasses and treated her constitutional affection which was followed out by your essayist and in a short while she was able to permit of the necessary dental work.

Case D—Mrs. A., wife of a physician, profoundly neuritic, though there were no appearances of defective metabolic or constitutional derangements (suggestion in this case) electricity was used as a moral support to the assertion that she would be well enough in a few days to permit of the necessary excavation of the teeth for fillings. A happy thought came when she mentioned that her husband had gotten good results with a neighbor, who had been hysterical, with chloretone. I thereupon told her that chloretone was a panacea for nervousness and that there could be no pain after its administration, knowing well its hypnotic and anodyne properties. I gave her 18-grain doses which made her feel drowsy, but it admirably supported the idea of suggestion that she would have no pain when I would operate, and it was so.

Case E—Mrs. H., was suffering with what she diagnosed as an abscess at the root, as patients are always wont to say, and had all of the symptoms of a chronic pericementitis, with the exception that I could not locate the infection. There was a small cavity in the tooth, a superior left lateral, and she said that the dentist who had preceded me had been treating it for some time. A careful examination tending to a diagnosis of abscess was made, but an attempt to enter the canal with a drill brought forth exclamations from the patient of very severe pain. After much time spent in endeavor to locate the trouble I made a diagnosis of neurasthenia and began treatment with a view to working on the patient's mind rather than the tooth, and then told the patient that I was going to draw the abscess out of the jaw by means of a fly blister and this appealed immediately to her imagination and she assented. She was given one-half grain doses of codein for immediate relief and ordered to see me in two days. The treatment was successful, but only temporary. At the next visit the following was elicited from the patient: Nervous cough, constant coughing, in a form simulating catarrhal affections of the throat, larynx, vocal chords and the nasal passages; she complained of a functional disturbance of the whole alimentary canal, indigestion, nausea, flatulency, palpitation of the heart, and neuralgia of the chest. This patient had taken everything suggested in the whole list of medicines and therapeutics by a number of physicians, and had visited the high climates and their sanatoria in search of relief. She was referred to a surgeon friend who found the trouble in the shape of a lacerated and ulcerated uterus, which, after proper surgical treatment, relieved patient of the whole train of troubles above mentioned.

Many cases like the above have been treated by the writer in the manner described, with good results, and this treatment is respectfully recommended.

MODERN DENTAL THERAPEUTICS*

By H. J. Feltus, D. D. S., Baton Rouge, La.

A REVIEW of dental medicine, its remarkable progress during the last decade, memorable alike for its scientific advancement and greater possibilities, is not without interest. The more recent scientific work of investigators, like J. P. Buckley, Herman Prinz and others has placed the treatment of dental diseases upon a rational basis.

Practical therapeutics of the diseases that we are called upon to treat in our daily practice is what we are most interested in. We, as progressive dentists today, are not satisfied with empirical methods. That results may be obtained by the use of certain remedies in the treatment of certain diseases is not enough, but we should know why results are brought about.

A correct diagnosis as to pathological conditions, a thorough knowledge of pharmacology and to have at hand remedies in a practical and convenient form are essential factors in all successful therapeutical results.

This subject, Modern Dental Therapeutics, embraces so much, that in a paper of this kind it is only possible to consider in a very brief and general way some of the most important and useful remedies.

Formocresol (Buckley) Formula: Trikresol, 4 drams; Formaldehyde, 4 drams.

This most valuable remedy for putrescent pulps and uncomplicated abscesses is too well known to require more than mention as a specific.

Phenol Compound (Buckley) -Formula: Menthol, 100 grains; Thymol, 200 grains; Phenol, liq. 15 fluid drams.

This combination of Dr. Buckley's is an ideal preparation in uncomplicated abscesses with a sinus. This remedy is a valuable one to use in forcing through the sinus to stimulate the tissue and disinfect the tract. For odontalgia from a live pulp, as an anodyne dressing for root canals, where the pulps have been removed, either by devitalization or anesthetization, this is a useful remedy. Useful in all cases where carbolic acid or phenol has heretofore been used. Properties: anodyne, antiseptic and disinfectant.

*Read before the Louisiana State Dental Society, 1910.

Refrigerant Counter Irritant (Buckley)—Formula: Menthol, 10 grains; Iodine crys., 10 grains; Chloroform, 1½ fluid drams; Tinct. Aconite, 6½ fluid drams.

In cases of incipient alveolar abscesses and septic pericementitis, as a local application to the gum tissue; or in all cases where a true counter-irritant is desired this remedy will be found highly efficacious. Also possesses sedative properties.

Dental Liniment (Buckley)—Formula: Menthol, 20 grains; Chloroform, 1½ fluid drams; Tinct. Aconite q. s., ad 1 fluid ounce.

This liniment is a true local sedative for immediate relief of nonseptic pericementitis, after removing the cause of the disease. This remedy may be also used with good results in cases of neuralgia, by applying it over the area of the affected nerve.

Euroform Paste (Buckley)—Formula: Orthoform, 1 dram; Europhen, 1½ drams; Petronol, 2½ drams, Petrolatum, 2½ drams.

For pain emanating from an abraded surface this remedy is a specific. It is not only palliative but healing. For pain following the exposure of process of extraction and laceration of the soft tissues, this paste acts like magic. Dr. Buckley also recommends it as efficacious in arsenical poisoning, and for the initial packing for wounds after surgical operations about the roots of the teeth and alveolar process.

Thymolized Calcium Phosphate (Buckley)—Formula: Thymol, 10 grains; Calcium Phos. Precip., 1 ounce avd.

This powder is used for making paste with several liquids and is employed in the treatment of many pathologic conditions. For pulp capping, a paste made with this powder and Eugenol or Oil of Cloves, placing the same with care over the exposure, and covering with cement, etc. In deep cavities approximating the pulp, this powder and Phenol Compound make an ideal non-irritating substance which will protect the pulp. With Formo-cresol this powder makes a paste excellent for filling fine and tortuous canals. The paste should be placed over the mouth of canal, working it into the same with a smooth stiff broach.

Dr. Buckley has given us several other valuable formulas, such as Eucapercha Compound, Eucalyptol Compound, Phenol-sulphonic Acid, etc.

Your local druggist can compound any of these formulas. However, Dr. Buckley realizing the great importance of uniform strength and compounding same true to a definite formula has arranged for having them compounded.

Local Anesthetic Tablet (Herman Prinz)—Formula: Novocaine, 1-3 grain; Thymolated Adrenaline, 1-1500 grain; Sodium Chloride, 1-8 grain. To make a 2% solution, dissolve one tablet in 15 minims sterile water.

I have found this a most valuable and safe agent for local anesthesia. The technique of injection should be fully understood; this subject is ably considered at some length by Dr. Prinz in his new Dental Materia Medica and Therapeutics.

Aseptesia (Mulford Co.) Fluid Magnesia Antiseptic—Formula: Hydrate of Magnesia, 24 grains; Thymol, 1-32 grain; Menthol, 1-32 grain; Oil Peppermint, 5-8 min.; Oil Gaultheria, 1¼ min.; Oil Cardamon, ⅛ min.; Saccharin, 1-16 grain.

This is an improved Milk of Magnesia, and as an antacid for many uses in dentistry I have found it to be a valuable remedy. Properties: antacid, antiseptic and mildly stimulant.

Bromural (Knoll & Co.)—In preparing hypersensitive patients for lengthy dental operations, sedatives are frequently indicated, and the strain of a lengthy and painful operation may be relieved considerably by the judicious administration of a sedative. I have found that bromural is a valuable drug in these cases. Dr. Prinz says that it is best administered in a grain tablet three times daily. I usually give one or two 5-grain tablets several hours before the operation, with good results. I believe Dr. Hecker was the first to advocate the use of this drug for this purpose.

Before using a drug we should have a clear conception of what we are trying to accomplish, careful study of the case may be necessary to reach a correct diagnosis, and we should never lose sight of the fact that Nature often produces her most rapid cures when left alone. Osler says that "a man rarely dies of the disease from which he is suffering," meaning, I suppose, that there is sometimes too much remedy.

THE VALUE OF STOMACHIC MEDICATION IN CONJUNCTION WITH PROPHYLAXIS METHODS AS A MEANS TO IMPROVE ENVIRONMENT OF RAPIDLY DECAYING TEETH*

By Dr. F. W. Low, Buffalo, N. Y.

IT is my purpose to speak to you tonight concerning the value of stomachic medication, in conjunction with the so-called Smith Prophylaxis Method, as a means to improved environment of rapidly decaying human teeth.

The writer, as Chairman of the Committee on Scientific Research, in making his report to the New York State Society in 1905, discussed the tabulations which he had made on specimens of saliva from the mouths of fifty-five of his own patients, or those of his Buffalo *confreres.* A scheme of comparative determination, by reactionary chemical color tests, was employed, with the object of determining the presence or absence of sulphocyanates, acetones, glycogen, chlorides, mucoid substances, ammonias, phosphates and urates.

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*Read before the First Michigan District Dental Society, 1910.

It was by the intensity of certain color provings that the relative proportions of these various substances were expected to be determined.

It was during this year's work that the important roll played by the abundant presence of potassium sulphocyanate in preventing the formation of the microbic, or as Black then called them, gelatinoid plaques, in the saliva, was discovered; and that the equally important roll played by the presence of excessive quantities of mucin on the other hand in augmenting rapid enamel decay was observed and noted.

In the course of that report, however, your essayist admitted his temerity and concluded by saying, that, "To attempt an investigation of the human saliva was much like going into a jungle without guide or compass, but deeming that the time had already come when the jungle must be explored, he exhorted that all should go in together in order that none should get lost; and advocated that a beating of drums and a blowing of trumpets should be generally indulged in, in the hope that thus being kept within hailing distance we might discover something."

Continuing the investigations the second year, your essayist less daunted, advocated the stomachic administration of potassium sulphocyanate in daily half-grain doses, and claimed that benefits to the teeth were resulting. Indeed, he had grown so bold as to try to induce his audience to picture in their mind's eye the status of our profession when, with the dental bur and engine abandoned, we should all join the ranks of the regular "pill doctors."

By this time our society had had enough of such a crazy advocate, and another Chairman to the Scientific Research Committee was appointed; but before his appointment was received this Chairman was already inoculated with the sulphocyanate theory, and continued investigations. His report shows that in the main he was convinced of the correctness of your essayist's theory, as the following brief extract from his report will show:

"While we would not have ourselves understood as claiming that potassium sulphocyanate is the only ingredient in the saliva that may dissolve gelatin, or that inhibits the formation of the gelatinous substance—for some cases have been reported to us that would contradict such an assertion—*but if there is another ingredient as potent, we have neither discovered nor investigated it.*"

Succeeding Dr. Muntz, from whom I have just quoted, Dr. Waugh has served two years. Opening the discussion of Dr. Waugh's report of 1908, in our printed transactions I find myself thus reported. In concluding his report as correspondent last year, the late lamented Dr. L. S. Goldsmith said that "While in the main the weight of evidence is in support of Dr. Low's theory, there is sufficient adverse evidence to make more clinical data desirable."

The chairman of the Committee on Scientific Research, Dr. Waugh, whose report you have just listened to, having examined the saliva of a very considerable number of students, reports, as you will remember, a smaller percentage of exceptions to my findings than did Dr. Goldsmith last year.

Upon being cross-questioned by me recently he stated that where there was any considerable proving of sulphocyanate accompanied with considerable decay, the presence of excessive mucir in the saliva was always noticeable.

He was right when he stated in his report that besides the question of the presence or absence of potassium sulphocyanate there was some one other factor possibly more than one—that needs to be considered. During the past year I have myself found two of them: in consequence, my theory to account for *all* conditions of unusual decay in the human teeth is modified to this statement: First, bacteria are to blame. Second, they do the greatest harm when protected under the plaque. Third, they do the next greatest harm when existing in prolific colonies, as we always find them associated with the flocculent, floating masses found in saliva containing excessive quantities of mucin, and fourth, in conditions discovered more particularly about the lower molar teeth, where a gray, cheesy deposit accumulates in consequence of colloid degeneracy of the tissues of the tonsils. This last deposit is known as glutinoid smear. It is further my belief that where none of these conditions exist in the human mouth, teeth may invariably be classed as above normal in structure, and remarkably free from decay. Where these conditions *do* exist, either singly or in combination, the important question to be answered is: What are the remedies? Even though the microbic plaque may prove to be not true gelatin, the experience of another year in the empirical systemic administration of half-grain doses daily of potassium sulphocyanate confirms my belief that benefit to the teeth results.

That the presence of potassium sulphocyanate in the saliva is in a measure solvent to the glutin smear I am still more positive but this remedy has no beneficial effect whatever upon conditions involving excessive mucin in the saliva. I have found, however, from repeated tests following the administration of Schlotterbeck compound (Hydrastis & Pepsin) administered in teaspoonful doses in a tablespoonful of water after meals, that the mucous follicles of the oral mucous membrane exude scarcely half the quantity of mucin after a few weeks' treatment. As a local supplement to this systemic treatment, the bathing of the oral membrane with a solution of glyco-thymolin and water, three or four times a day assists in stimulating to healthy secretion.

In more than one case where mucin was excessive in the saliva, I have discovered incidentally that conditions of the stomach shared with the oral cavity in a decided improvement after the Schlotterbeck treatment. My *confrere*, Dr. Beach, who has experimented considerably along these lines, I am sure will bear witness to the correctness of my conclusion regarding treatment.

Proportional chemical analysis of the saliva is a quest approaching the impossible, and can be undertaken with hope of success only by the most profound student of organic chemistry; meanwhile, the dentist who should become so proficient—following even music as an avocation—as to rank among the great, had better give up dentistry and earn his living entertaining an appreciative public with his trombone, bazoo (bassoon) or fiddle.

In the December *Cosmos,* Prof. Kirk says editorially, "The whole question of susceptibility and immunity in connection with the carious process is still a sealed book." Personally, I feel that I have helped to pry the cover open *just a little way,* and for the accomplishment of that *very little* I have waded in to upward of two thousand specimens of human saliva, and am not through wading yet. Indeed, gentlemen, I come to you crying Help! Help! not with the hope of finding "that most profound student of organic chemistry," but rather in anticipation, that disregarding the inconvenience of so boggy an adventure the entire membership of your society may become infected with my enthusiasm to the extent that you will all don your high-top rubber boots and join the hunt, for it is not necessary that we should be profoundly studious so much as it is incumbent that we should be empirically observant. I say this because my observation of conditions confirms from day to day the opinion that the problem, after all, is one principally of bacteria, and that the widest variation which the profoundest student may yet discover in the proportions of the several chemical constituents distinguishing between such saliva as is reckoned bad, in contradistinction to that other which is called good, will have no bearing on the question of rapid tooth decay, except insofar as such differences may influence the behavior of the microbic-plaque-forming varieties of bacteria.

This statement leads up to the consideration of the work done during the past year by the Scientific Research Committee of our New York State Society. Work which I deem most important and most convincing yet of all. Dr. L. M. Waugh, of Buffalo, acting as chairman, is entitled to great credit for having engineered the enterprise and Dr. George Roberts, a practicing physician, is equally entitled to great praise for having conducted the somewhat tedious steps of investigation with the utmost painstaking care.

Let me state briefly, in conclusion, the opinions arrived at by Dr. Waugh and his committee, resulting from this, his most recent work, and then in an informal "jack lantern" sort of talk show you some pictures which Dr. Waugh has most kindly loaned me for this occasion.

DR. WAUGH'S OPINION

I am permitted to make this extract from the manuscript which has already gone forward to the publishers of the *Dental Cosmos* as the Committee on Scientific Research Report to the New York State Society for 1909.

"The inhibitive action of potassium sulphocyanate upon plaque formation," says the report, "as shown in the experimental work thus outlined *is so obvious* that the committee feels justified in urging the conservative administration of sodium sulphocyanate as recommended by your former committee, of which Dr. Low was chairman. In this way its effects *may be studied clinically,* which is, after all, *the crucial test.*"

Now, gentlemen, at last "the cat is out of the bag," you see why I come to you crying Help! Help! This recommendation, however, embodies only part—though the most essential part—of the co-operative investigation for which I made my plea.

In a paper read before the Northern Ohio Dental Association in Cleveland last June, I said, "I should indeed be very sorry that I had ever advocated stomachic medication should haphazard medication result at all generally, because of *any* of my writings."

This statement, here and now, I wish most emphatically to reiterate. The tests which you are called upon to make before beginning systemic medication have been so often published and are so simple that I hesitate to occupy your time by again repeating them, but should there be any general desire manifested, I have brought the necessary apparatus and will be glad to demonstrate after the adjournment of your meeting.

I may say in parenthesis, they are fully set forth on pages 764 and 765, October DENTAL SUMMARY, 1909.

DISCUSSION.

Dr. R. W. Bunting, Ann Arbor: It has been a great pleasure to me to listen to this paper and to view the slides which Dr. Low has been throwing upon the screen. The subject is very timely, in as much as it has been engaging the interest of the profession for the past several years and seems now at this date to be more discussed and investigated than ever before.

Since the earliest periods of our profession, inquiry and research have been made in the direction of the causes of caries, and the factors which determine the susceptibility and immunity of the teeth to these conditions. For a long time it has been known and accepted that the initial cause is bacteria acting in conjunction with a gelatinous or glutinoid plaque. However, no satisfactory explanation has been given of the fact that these microbic plaques form in one mouth and not in others, or in fact may be inaugurated or become extinct in the same mouth at various times in the life of the individual.

About ten years ago Dr. Micheals, of Paris, gave out the results of his investigations of the human saliva, calling attention to the variations in its constituents, and the relation of these variations to the dyscrasia of the body. Since this publication a great deal of investigation has been directed toward the analysis of the saliva in the quest of some principle which might be the determining factor in the immunity and susceptibility of teeth to caries. As a prime mover in this work, great credit is due to Dr. Low for the work which he has done and the general interest in salivary analysis which he has brought about. In connection with the Committee for Research of the New York State Dental Society, Drs. Low, Waugh and their *confreres* have carried on considerable examination of all the constituents of the saliva, but investigating more especially the Potassium Sulphocyanate constituent. They have endeavored to prove that the presence of a considerable amount of KCNS in the saliva is inimical to the formation of microbic plaques, and is conducive to a condition of immunity of the mouth toward caries. They have from this hypothesis advocated the administration of KCNS tablets to patients whose salivas are low in that constituent, and Hydrasitis and Pepsin to those who have a superabundance of mucin.

With all of this investigation the profession all over the land has been in hearty sympathy, and has been awaiting with great interest the results of the committee and others who are trying out these principles in actual practice. A very good statement of the consensus of opinion of the investigators is set forth in an article by Dr. Hans Hecht, of Berlin, published in the November *Cosmos* for 1909. In this he gives the results of his own work and that of Drs. Low and Waugh and a number of other investigators covering many thousand examinations. The report is unanimous in regard to the presence of KCNS in the saliva as being synchronous with a condition of immunity. There is a diversity of opinion as to the germicidal value of KCNS in the strength normally found in the saliva. Then there are a few who believe that the KCNS in the saliva is but a criterion or coincidence and is not the causative factor in the question of immunity and susceptibility. However, Dr. Hecht is a firm believer, himself, in the efficiency of KCNS, stating that by the internal administration of the drug, that caries was arrested, that hypersensitivity of the teeth was decreased, and that the local treatment of stomatitis ulcerosa was reinforced.

For the past year I have been very much interested in the work, and have wished that I might have been in closer touch with the men who were so actively engaged in this investigation. I, myself, have not been able to carry on any extended or thorough research in this line, but I have made some tests, qualitative only, on the salivas of our students and inmates of our hospitals. I wished especially to determine whether or no the sulphocyanate hypothesis would prevail in the cases which I examined. I was surprised and disappointed to find that they did not follow the rule or the observations of so many other men. I have compiled a chart of the statistics obtained from the salivas of nearly 100 students, and with your permission will throw it upon the screen at this time.

		No.	Heavy Mucin.	Acid.	Smokers.
		IMMUNE			
KCNS	+	19	31%	37%	63%
KCNS		21	52%	33%	38%
KCNS	light	8	13%	50%	38%
		SUSCEPTIBLE			
KCNS	+	15	53%	73%	93%
KCNS	--	13	8%	39%	54%
		NEARLY IMMUNE			
KCNS	+	3	0%	66%	66%
KCNS	—	12	33%	42%	50%

The cases were divided into three divisions, Immune, Susceptible and Nearly Immune; the latter being those cases in which there was some doubt as to the presence of immunity. Each of these are classified as to the presence or absence of KCNS and in the first column the number of cases has been set down, in the second the per cent. of cases having heavy mucin, in the third the per cent. having an acid reaction, and in the fourth the per cent. who were smokers.

It will be seen that among the Immunes there were more salivas which were KCNS negative than KCNS positive. At the same time there was a high per cent. of these which had heavy mucin, especially those lacking in KCNS. The number of cases showing an acid saliva is somewhat lower than in the Susceptibles.

So also in the Susceptible class there is a direct departure from the rule, inasmuch as there are more that have KCNS present than do not. It will be seen, however, that in those cases which contained KCNS there was a large percentage which had heavy mucin. Further, there were 73% of them that showed an acid reaction. A remarkable coincidence is seen in the fact that in all cases there is a larger per cent. of smokers who are KCNS positive than there are in the negative class.

I do not wish to be understood that I consider this small number of examinations in any way disproves the KCNS hypothesis, but I have presented them for the reason that I have been puzzled by their divergence from the mass of work done by others, hoping that Dr. Low may be able to give me some light on the subject.

In other examinations which I have made I have not been able to determine the presence of any definite relation between KCNS and Immunity. I have found many cases which have been Immune for years and yet show no KCNS. In the fear that the time of day might influence the test, I selected 10 of these cases and examined them seven times daily for several successive days, but found no KCNS in any of them.

As has been stated it is very easy to cause the salivary glands to secrete KCNS by internal administration of the drug. In my own saliva, which is normally negative, one grain KCNS gave a positive test for nearly two months. And yet there are some cases in which the salivas will not respond to several grain doses. Should it be proven that such medication would have a marked restraining action on the advance of caries, this fact would be one of the greatest boons to humanity of the age. However, this conclusion can only be arrived at by a great deal of very careful and painstaking work, such as we have seen upon the screen this evening. It must be remembered that this work of Dr. Waugh has been done outside of the mouth, and the influence of any salivary constituent is vastly different in any solution other than the saliva. This may be illustrated by the findings of Dr. Head, in which he states that acid solutions in some salivas are ten to twenty times weaker in their action than the same solution in water. So that it is evident that the efficiency of any constituent of the saliva is dependent upon the nature of the saliva in which it is found, and the restraining influence exercised by the salivas. Just what this restraining influence is, its nature, its cause and its origin has not been determined, but perhaps when we do understand more about it, many of these phenomena which we are investigating will be made more clear.

It has been reported from various sources that the administration of KCNS to Susceptible and the maintenance of a good reaction in their salivas has a restraining influence upon the progress of the caries in those mouths. It is very probable that in those cases prophylaxis has been employed, the carious teeth repaired and interproximal contact restored, putting the mouth in a state of good hygiene, at the beginning of the treatment. In such a case with proper care by the patient the mouth might remain in good hygienic condition and be immune for many years, but how much of this result can we attribute to the KCNS introduced into the saliva and how much to the good hygiene? We have all seen cases in our own practices by the score, in which foul susceptible mouths have been made continuously immune by good hygiene alone. So also may we turn to the work of Dr. D. D. Smith, who maintains that caries may be forever averted in any mouth that is kept in perfect condition.

There is no question as to the beneficial value of Hydrasitis and Pepsin in the reduction of mucin in the mouths of some individuals. Such a reduction would decrease the tendency to caries very markedly. The administration of KCNS does no harm, but I think we all are agreed that further work must be done before we shall fully understand its effects. Should it be found that administered KCNS is effective, it would aid us as dentists in our endeavor to save teeth. It would be of great value in cases of pregnancy, warding off the usual period of susceptibility; and finally the teeth of those too poor to afford dental services, especially of the public school children, might be kept from destruction.

All praise is due to these men who are so actively engaged in this great work and we wish them all success in their labors.

Dr. G. C. Bowles, Detroit: When in 1908 I became acquainted with Dr. Low's potassium sulphocyanate theory I had been practicing prophylaxis after Dr. D. D. Smith, according to my ability and understanding of the subject, for some two or three years. I had come to recognize its undoubted value, to the favored few to whom it could be applied, and to recognize also, because of the keener observation engendered by this practice, that comparatively few mouths were really ever clean, even among my most careful prophylaxis patients. Almost always slimy deposits were to be found somewhere, most commonly upon the lingual surfaces of the lower molars, and significant fact, where decay is of all places most rarely found. The basis of oral prophylaxis, is, I believe, that teeth kept absolutely clean all of the time, will not decay, and this I firmly believe. But absolute cleanliness means at least that the acid generating bacteria must be disturbed so often as to be given no opportunity to produce acid of sufficient concentration to harmfully effect the teeth. This is a feat difficult of accomplishment. I am unable to effect it in my own mouth, for caries is still progressing there. This is no reflection on my prophylaxis, however, for I do not get the treatments regularly. But among my regular prophylaxis patients who were previously susceptible, our combined best efforts do not render their teeth immune. Though I am confident that with the majority of people the condition of the teeth improves in proportion to the increase of care they receive. This simply supports my contention that to reduce dental caries, even 90% (Dr. Smith claims to do that) by our present prophylaxis methods, is an accomplishment reserved for the very few specially inspired disciples of the art who are able to inspire their patients with their own faith and enthusiasm and high standard of endeavor. But even if we all could accomplish as much, and if we could put all our patients on prophylaxis we still would be but blowing the smoke out of the attic while the fire smoulders in the basement. We would vastly increase our usefulness and extend its sway if we could find the fire and put it out. In other words, there are some mouths, naturally immune to decay. If we could discover the secret of this immunity and the power to put all mouths in the immune class, we would confer upon humanity a boon equalling the greatest yet conferred by man to man. Dr. Low had this vision and aspired to be the deliverer of his people. Potassium sulphocyanate was to be an agent, if not the agency, for effecting this delivery. Dr. G. V. Black had stated that under favorable conditions the bacteria of dental caries protected themselves under a film or plaque of a gelatinoid character. Dr. Low found that KCNS was a solvent of gelatin, that the saliva of individuals immune to caries had this agent in abundance and that the saliva of those subject to rapid decay of the teeth were markedly deficient in it. His conclusion was, therefore, that KCNS was an inhibitor of dental caries and that its administration in daily half grain doses would not only immediately produce a showing of KCNS in the saliva of susceptibles equal to that of immunes, but that in a short time the salivary glands would again normally continue the interrupted secretion of this very important constituent. This theory looked reasonable and conclusive. It appeared as if herein we had an agent that would be on the job twenty-four hours a day, seven days of each week, for rich and for poor, doing all the time a more effectual work than we could hope to do with stick and pumice, once a month, for the favored few. I hailed the hope with enthusiasm and at once began the tests and the administration of the KCNS according to directions. Now, most of my patients are of the gentle sex, most of them have more or less decay and most of them showed a deficiency of KCNS. When such a patient presented with teeth showing rapid decay I was able to prophesy thus: "an examination of your saliva will probably show a marked deficiency in a certain protective element therein," and I was usually right. I learned after a little, however, to be cautious about predicting an abundant evidence of KCNS in the saliva of immunes, or of relative immunes, for here, I regret to say, my experience did not coincide with Dr. Low's. Indeed, after accumulating a number of such records as the following, I began to feel my faith tottering:

Miss G. R., who had a prophylaxis treatment and two small occlusal cavities filled in July, 1907, presented again on April 3rd, 1909. After a lapse of two years her teeth were practically clean and but one small occlusal cavity was found. The young lady is of the lymphatic temperament and not over careful about her person and frankly admitted that she gave but little thought to her teeth. Her saliva was examined and showed KCNS 1+.

On April 14 the saliva was again tested with the same result.

When the saliva contains an abundance of KCNS, amounting to about 1 150 of 1%, the reaction with the ferric chloride produces a characteristic blood red color. This I numbered four. Where the color change was just perceptible it was numbered one. Two and three were intermediate. This somewhat indefinite scale was used in estimating the amount of KCNS present in the tested saliva.

(With my male patients the uncertainty was even greater. At the last annual clinic of this society, for instance, I came across four or five men whose KCNS tested below two, and who yet claimed to be practically free from dental caries, while others with provings as high as four, were highly susceptible.)

Nevertheless I continued the administration of KCNS in such doses and at such intervals as seemed to meet the requirements. At one time I had ten or twelve patients on the treatment at the same time. Three of these I kept on the treatment for a year, testing the saliva at intervals and keeping it up to a point between two minus and four. In all three cases mucin was abundant, the teeth stained badly, were difficult to keep clean and decay was very active. While under treatment these conditions were certainly improved. The stains and accumulations between the monthly prophylaxis treatments became markedly less and while a year is much too short a time in which to determine whether or not caries was inhibited, under the improved conditions one might naturally expect that it would be, to some extent at least.

Whether or not the KCNS was responsible for the improved conditions, or whether they were due to the greater care given the teeth by the patients, young high school pupils, I am not prepared to say. Giving so much thought to their teeth it would only be natural if they very greatly increased their care of them. After taking one-half gr. KCNS daily for two weeks my own saliva tested at least four plus, higher than I found any unmedicated saliva to go, but my mouth was not rendered self-cleansing thereby. Thirty-six hours' disuse of the tooth brush and my teeth were beautifully furred, and a dark brown taste was gathering in my mouth.

I discontinued the use of KCNS for two reasons: First, because the salivary glands apparently were not stimulated to any increased elaboration of KCNS. When the administration of it ceased the amount present in the saliva quickly fell back to where it was in the beginning. In the cases kept under treatment for a year, one-half gr. tablets were, at first, taken daily for two weeks. At the end of this time the KCNS would run as high as four. Then there was a rest of two weeks, at the end of which time the test would show a scant two. Later on I found that half the dose, one-half gr. every other day, gave satisfactory provings, but the skip of a day interrupted the routine and invited lapses which sometimes ran into several days. This could be avoided by substituting a sugar pill for the off day.

The second reason for my disuse of KCNS was that after Dr. Bunting's tests made at Kalamazoo, last June, it looked as if the recent smoking of tobacco was responsible for the high provings of KCNS in the saliva of those whom we had considered as the favored ones, and this regardless of the presence or absence of dental caries.

For these reasons my enthusiasm waned. I felt that it were better for the present to depend on blowing the smoke out of the attic rather than to pour water into a corner of the basement on such small assurance that the fire was there.

Now, ladies and gentlemen, I would not have you for a moment think that I am putting my limited and negative experience against the exhaustive work of Dr. Low and his fellow workers. Dr. Low has come here offering us freely the latest development of his idea, and asking for co-operation and help. He seeks only the truth no matter where it leads. My experience may or may not be a phase of the truth; of that he is more competent to judge than am I, but it is my experience and I offer it for what it is worth.

A LABORATORY HELP

By C. M. Torrance, D. M. D., Frankfurt, Ger.

A piece of linoleum five or six inches square will be found to be a very convenient help in pouring up plaster models. It gives a flat base to the model, can easily be "peeled" off when the plaster has set, and does not chip or break as does a glass slab. It is a proper companion to the rubber plaster bowl.

THE EDUCATIONAL CAMPAIGN.

Preliminary Report of Results Attained in Marion School, Cleveland, Ohio.

To the Editor of The Dental Summary.

Dear Sir:—Under separate cover I am sending you some information and data which bears upon the work we are doing in connection with the work undertaken at the opening of the Oral Hygiene Campaign of the National Dental Association last March.

At a later date I will be able to give you more definite information relative to the Marion Class. We have been unable to complete all the work necessary to put the mouths of these children in perfect condition; but I am informed by the Nurse that it will take but a few days to complete this work.

Arrangements have been made with the principal of the school to keep in close touch with the class for the remainder of the year, when our psychological tests are taken.

I am sending you a statement, made both by the Dental Nurse and by the principal of the school, Miss O'Neill. These reports speak for themselves.

I am also sending you duplicates of the psychological tests made, together with a report of the school records up to the present time.

I believe the work is of sufficient importance or value that, while the work is not completed, the report should not be delayed six months waiting for final records. I wish to state my personal views relative to the matter, and say that the records made by the class have succeeded beyond my fondest hope when I began this work. When you consider that I was very enthusiastic to begin with, the importance of the above statement will be more fully comprehended.

If there is any special information you desire in connection with the class I will be very glad to secure and forward the same for you and for your journal.

Sincerely yours,

W. G. EBERSOLE.

Cleveland, Ohio, Nov. 25, 1910.

With regard to the dental class, I will say the following:

In May, 1910, when the regular dentist, who inspected the entire building, had completed his work, we examined the records of the children from the fourth to the seventh grades, inclusive (omitted the eighth because we knew they would leave us in June). We selected from these a class of forty (40) children whose record sheets showed the worst conditions, or the greatest number of imperfections. Dr. Krejci, who made the inspection, assisted us in making this selection.

The children included foreign born and native born from families of foreign born parents, having a residence in this country ranging from six months to all their lives. We had among this number some of the best behaved and some of the worst behaved children of the building. We had a number who carried truancy cards and some who were very severe cases of truancy and incorrigibility. The majority of them were repeaters, that is, they were from one to four years behind their grade.

The first day we organized the class we had a plain understanding with the children. We told them that we expected to give them tooth brushes and teach them the use of them; and that we expected them to clean their teeth three times daily. That we expected to visit their homes and teach them the process of mastication with the understanding that they were to carry out our suggestions. We told them that there would be certain times when they would be called to take psychological tests; or to listen to instruction that would be given; or submit to inspection; and it was incumbent upon them that they attend when notified. We said nothing to them about scholarship or the results that we expected or hoped to obtain. We gave them to understand thoroughly that infractions or violations of the above conditions would result in their dismissal from the class; and, that the children who lived up to all our requirements would be rewarded by a five-dollar gold piece on December 25th, 1910.

Today we have twenty-eight (28) members in good standing. Four were dropped from the class because they moved out of the district and lived too far to return and attend meetings. The other eight were dropped because of failure to comply with some of the conditions. One boy played ball and neglected his teeth; two boys failed to attend the tests when called to the building; one boy went to work; the other four failed to comply with orders or to show proper spirit with regard to directions given; made no effort to masticate their food, keep their teeth clean, etc.

We were handicapped in the following ways: The long three months' summer vacation broke into our work. The children were scattered and lived under various conditions which were not at all uniform. Coming back in the Fall in the majority of cases they were assigned to new teachers, causing a fluctuation in the standard of marking. The greatest handicap came to us because of a decided change in the methods of promotion and methods of study that were installed this year in the Cleveland schools. In the methods of study we are striving to throw the responsibility more fully upon the child himself. Having been trained all these years in having the teacher prepare and almost pre-digest the work, this year the pupils were thrown on their own responsibility and compelled to a great extent to work out their problems for themselves. This transition necessarily causes a loss. Instead of the yearly promotion as heretofore, we will promote the children quarterly. It has been our experience heretofore that children do not do as well in their work the first three months as later in the year. With our quarterly promotion they are held accountable for the first three months' work and promoted thereon. Notwithstanding these various handicaps every one of the dental class except two has made his grade and at the end of this three months has been promoted to the next higher division.

I will say that from the organization of the dental class up to today, I have said not one word to any child or any teacher about this dental work affecting his scholarship, as I did not want to draw the attention to that, either in the minds of the children or the teachers, so that any improvement would be perfectly normal. In fact, in some of the cases where the classes were new to the teacher, the teacher did not even know which of her pupils were members of the dental class. Therefore, the results obtained in scholarship resulted from normal conditions and not from any undue effort.

In watching the class from its inception I have noticed a marked improvement in the conduct and application of each child; in his general health and personal appearance, particularly in the clearing up of the complexions.

One boy who gave his teacher very much trouble and was referred to my office frequently, has not been in difficulty once this year. The truancy has disappeared.

The children are very proud of their teeth and there is a noticeable increase in self-respect and proper bearing.

Most of the children are members of large families and the contagion has spread among members. In the few homes where it can be afforded the members are going to private dentists. I am constantly appealed to to arrange for dental work in our clinics.

Our nurse, connected with the medical department, who came to us in September, was much impressed with the attention that the children as a whole were giving to their teeth. I believe the work with the special class is responsible for this condition.

Trusting I have touched upon the points that interested you, and holding myself in readiness for any further expression that I can make, I am

Sincerely yours,

(Signed) CORDELIA O'NEILL,
Principal Marion School.

The Dental Nurse was employed by Dr. W. G. Ebersole, Chairman of the Oral Hygiene Committee of the National Dental Association, for the purpose of keeping in constant touch with each individual member of the class to ascertain the faithfulness with which instructions given were complied with. In fact, she was to act in the full capacity as a nurse, keeping the doctor posted as to all progress made, obstacles encountered, and failures to comply with instructions.

To do this it has been necessary to visit the class weekly in their homes at an irregular time, sometimes early, again late, that the children might not know when she was coming, catching them wholly unprepared in order to ascertain their faithfulness. To teach them the correct use of the brush, some of these children had never used a brush and have had to be carefully and patiently taught. The nurse also visits the class at the school. Her work is to see that they perform their dental toilet as per instructions, to teach them to use their teeth properly in eating and to use no liquids until after the meal; also to impress upon the parents the need of the thorough chewing; to make appointments for the dentists, who were employed each morning—except Saturday—during the summer, and are employed four mornings each week now, giving them from three to five children each morning. The nurse visits the dental clinic following up the appointments, seeing they are kept, and if not, why; and receives reports from the dentists, keeping in touch with the need of each child. The grading of all psychological tests and to assist in giving these is also part of the work of the nurse. Also all arrangements for the X-Ray class. Two meals have been given at the Marion school to teach mastication, the nurse assisting, one meal being a three-course dinner, which enabled us to teach the children how to handle the variety of food.

After the class had been formed it was necessary that a careful and full examination be made of each individual member of the class, by a man of recognized ability and integrity. For this reason Dr. Varney E. Barnes, orthodontist, was selected and made the examination along the broadest and most comprehensive lines; examining the mouths of the children for tooth decay, gum disease, dental deformity, including impacted teeth. The idea being to recognize any dental condition which might interfere with the child's physical or mental health, and to put on record any such condition found which might nullify the effect of ordinary dental treatment. At the end of the experiment, Dr. Barnes will again examine the mouths of these children and report change in condition.

When the class was received the children were ill-kept and careless in their toilet, having sallow complexions and a general look of neglect. Since treatment they are clean, bright and healthy with clearer complexions. Even a casual observer would say "how improved." Would add here that the example set by the child in the home is being felt, the other children keeping their mouths clean and yet without reward.

The condition in the homes has been against us. The houses are small and dirty with very poor, if any, ventilation. Bad food combinations, excessive use of candy, pop and drinks of that sort; families ranging from eight to twelve and fourteen, and living in badly congested condition; the parents, with exception of two or three, too ignorant to appreciate the value of the work being done for their children. This statement applies to every home, with the exception of two, those of two colored children. This is a constant drawback, making it the more remarkable that we have results in so short a time. Some of the parents, who now see improvement, have followed our instructions, deriving benefit. Also, the Summer Camp, taking a number of the children away for two weeks at a time, each.

Nearly all the children are Jewish, and we have had fourteen Jewish holidays, of one-half day duration each, namely, New Year's Day, Day of Atonement, Feast of Tabernacles. Day of Atonement and Feast of Tabernacles each preceded by two days called holy, making seven whole days, or fourteen half-days.

Ten days the electrical apparatus at the dental clinic was out of order. A great deal of the work of one of the dentists, employed during the summer, having to be done over; and with occasional illness on the part of the dentists employed, it has meant, altogether, a loss of about four weeks' time. Other holidays have also interfered, namely, Fourth of July, Labor Day and Thanksgiving.

One of the things to be considered is that these children have been out for their dental care which detracts from their school work and psychological tests.

Frank Silverstein, age 15 years. A delicate boy, subject to severe spells with his heart, occurring weekly and until the past year necessitating his absence from school. His gums and teeth in a very bad condition; and, although work not yet completed his health is much improved, having had but three attacks with the heart since May, two slight, and one severe, keeping him out of school one and one-half days. This is the only case of illness we have had with the class of thirty children.

Family of ten, eight children. Father a tailor, not busy all the time.

One year behind grade; scholarship, fair; effort, good; attendance, regular; conduct, good.

Improvement, 27.3%. Grade 7.

Helen Wright, age 13 years. Mouth in bad condition. This child suffered with sick headache and indigestion. She is now entirely free from this and has been for some time. Her work was completed Oct. 18th. The mother is so delighted with results in the child that she follows my instructions in mastication, etc., and is improved.

Scholarship, good; effort, good; attendance, regular; conduct, fair.

Improvement, 8.28%. Grade 7.

Lillian Gottfried, age 14 years. Immediate treatment was demanded in this case, beginning with prophylaxis. Bad case of green stain and diseased gums. Work com-completed August 15th. In spite of a deformity on the left side of the jaw the girl shows improvement generally.

Ten in family, eight children. Father is agent for lace and household furnishings.

Scholarship, good; effort, fair; attendance, irregular; conduct, good.

Improvement, 14.04%. Grade 7.

Sol Katzel, age 16 years. Teeth coated with green stain and badly decayed. Gums diseased. Teeth have been treated and have been able to retain all but two which were extracted. His work not yet completed, and, in spite of the strain upon the nervous system incident to the work, he has not been ill. Has always been a delicate boy.

Fourteen in family, eleven children. Father has a small grocery.

In America four years; leads a street life. Scholarship, good; effort, fair; attendance, regular; conduct, erratic.

Improvement, 39.88%. Grade 7.

Jake Bernstein, age 14 years. This mouth had had no attention whatever, which is true of nearly all the children. Had to have a prophylaxis before anything else could be done. Now has a beautiful set of teeth. Work not yet completed. He is now entirely free from indigestion and constipation, which was very bad, and through thorough mastication has lost desire for his four to six cups of coffee daily, and now only takes one a week. He is a constant source of delight he is so revitalized.

Family of seven, five children. Father a junk dealer.

Scholarship, poor; effort, fair; attendance, fairly regular; conduct, fair.

Improvement, 7.5%. Grade 7.

Morris Krause, age 11 years. (A degenerate case as a result of his physical condition.) Teeth needed cleaning and filling. The principal of the school declared him her worst pupil, playing truant, etc. He is improved and has developed into quite a little gentleman, regular in attendance and doing better work. Was drinking four and five cups of coffee mornings, and now, owing to more thorough mastication of food has lost this desire and drinks only one cup at the close of the meal.

Family of seven, five children. Father a presser of caps.

This is a very interesting case. At the time the class was organized this boy was lawless, selfish and untrained in the highest degree; noted for truancy; a year behind his proper grade.

Improvement, 201.3%. Grade 4.

Anna Pankuch, age 11 years. This child had never used a brush and it was hard for her to grasp the idea of how to handle it. Teeth were badly coated with a green stain, also filling to be done. Teeth now in fine condition and color better and greatly improved in general health. Twelve in family, ten children. Father has a printing office.

One year behind grade. Scholarship, fair; effort, good; attendance, fairly regular; conduct, good.

Improvement, 11.84%. Grade 5.

Rose Lieberman, age 12 years. Her mouth had been neglected and demanded a great deal of care. Worked on her from July 6th to Aug. 19th. Now has a beautiful set of teeth, which she is making use of in thorough mastication. Had considerable difficulty in persuading the mother not to give her sloppy food. There is general improvement also in complexion. Eight in family, five children. Father is agent for the Goodman Piano Co.

One year behind grade. Scholarship, fair; effort, good; attendance, fairly regular; conduct, erratic.

Improvement, 44.16%. Grade 5.

Issie Grey, age 13 years. Has always been a weak child. He has improved mentally and physically. The father's statement is that the child is much stronger and that since he has been receiving this treatment he would give more for him than for all the rest of the children. Eight in family, six children. Father is a peddler for a beer concern.

Scholarship, good; effort, good; attendance, very irregular; conduct, good.

Improvement, 18.8%. Grade 6.

Lillian Cohen, age 14 years. Mouth in bad condition. Generally improved and relieved from indigestion. Seven in family, five children. Father a peddler.

One year behind grade. Scholarship, fair; effort, fair; attendance, very irregular; conduct, poor.

Improvement, 52%. Grade 6.

Helen Cohen, age 12 years. Mouth in bad condition. This was a case of malnutrition. Dental work completed. She is revitalized and making steady progress. Five in family, three children. Father a tailor.

Two years behind grade. Scholarship, good; effort, good; attendance, regular; conduct, good.

Improvement, 32.2%. Grade 5.

Abe Meyer, 12 years of age. This mouth did not require as much filling, but had been neglected and a diseased condition had started. We took him just in time. Now that his work is completed he has a fine set of teeth and is improved physically; to be explicit is alert and vigorous. Family of six, four children. Father a tailor.

Scholarship, fair; effort, good; attendance, fairly regular; conduct, good.

Improvement, 30.26%. Grade 6.

Harry Freeman, age 12 years. Badly neglected mouth. At first was inclined to be indifferent and careless. There has been a change in his disposition; not so sullen. Also relief from constipation. A general physical improvement. Family of nine, seven children. Father a tailor.

A dogged, sullen disposition; hard to manage. Scholarship, fair; effort, fair; attendance, fairly regular; conduct, fair.

Improvement, 50.2%. Grade 6.

Gussie Hammerschlak, age 12 years. This case demanded immediate attention. Teeth decayed and aching, also diseased gums. Her work is completed, and she is bright and healthy. We find that as soon as the mouth is placed in a healthy condition new life is manifested. Family of nine, seven children. Father a foreman in clothing establishment.

One year behind grade. High strung and nervous. Scholarship, fair; effort, good; attendance, regular; conduct, very variable.

Improvement, 28.06%. Grade 5.

General average increased efficiency, 37½%.

Tests used: Wallin's Psychological Tests of Mental Traits, covering the following: Memory test, Spontaneous Association, Addition, Association by Opposites, Quickness and Accuracy of Perception.

A representative of THE DENTAL SUMMARY was asked to be present at a special examination of this class at the Marion school, Thursday, December 22, at which very satisfactory results were brought out. Physical Culture Instructor Riley stated that a very marked improvement in the physical condition of the class was apparent, while the principal and teachers were most enthusiastic.

The tests were the same as those mentioned above, and were given in the same order.

At the beginning of each test the papers or cards were placed upside down on the desks before the members of the class, and they were instructed to place their names, age, school, grade, boy or girl, date, hour and condition, at the top of the paper, and when this was done to lay their pencils down to indicate that they had finished. At a given signal pencils were taken up and papers turned and the test began.

Memory Test—A card containing a column of ten numbers of three digits each, printed in large black type, was exposed before the class for a period of forty-five seconds when they were withdrawn and the class given an interval of sixty seconds in which to write down as many of these numbers from memory as they could recall.

Spontaneous Association Test—Slips containing a column of common words were used for this test and opposite each word on same the child writes the word which first comes to his mind as a result of reading the word printed on the slip. Eighty-five seconds were allowed for this test.

Addition Test—Cards containing a number of columns of figures or numbers of one digit each are used for this test. These columns were to be added as accurately as possible, the principal of the school giving the instruction that they were not to add a column the second time nor to prove their work. 120 seconds were allowed for this test.

Association by Opposite Test—Slips for this test contain a column of words with parallel spaces. Opposite each word the pupil is to write its opposite. Miss O'Neill, the principal, here illustrated what they were to do, by saying, "If you find 'better' on your paper then you think 'worse.'" Eighty-five seconds were allowed for this test.

Quickness and Accuracy of Perception Test—Here the papers contain all the letters of the alphabet, in capitals, arranged promiscuously in lines. The children are to cross out as many capital A's as possible within the given limit of time. Miss O'Neill illustrating by use of figures that where two letters were side by side they must be crossed out *separately*, not by drawing a line through both at once. One hundred seconds were allowed for this test.

Following the tests remarks were called for from those who had gathered for witnessing this test.

Dr. W. G. Ebersole said: We have with us today two of the leading dentists of this city who are going to examine your mouths. We also have one of the gentlemen here who represent the firms that made it possible to do this work.

I want to say to you, Mr. Harter, that we are making this test today for you. We have six tests in all, and including today, have made two duplicate tests.

These boys and girls show marked improvement in their school work and in their personal appearance. Rosy cheeks have taken the place of faces covered with pimples; complexions that were muddy and sallow have cleared up to a marked degree.

This class is making a record for dental service throughout the world. This work will be published all over the world. A teacher asked me the other day for data and material concerning this work to be published in Germany.

The visitors were then introduced and spoke briefly in language that the children could understand. These talks were followed by some apt remarks by Dr. Ebersole, who said:

Boys and girls, you remember that pretty nearly a year ago we came out here to tell you what we wanted you to do. We told you that we would give each of you who remained faithful a five dollar gold piece. We started with forty children in the class and expected to have twenty at this time. Instead we have twenty-seven. You have fulfilled your part of the contract, we will fulfill ours.

Owing to things we could not overcome the work has been delayed in the clinics. We had hoped to have same completed and by this time have an opportunity to show what good work you could do.

We hope to make two more tests later in the year. At the same time we trust you will be just as faithful in taking the tests as you have been in the past.

We hope to have this class present at the meeting of the National Dental Association in this city next July. At that time we expect to have a paper presented by Miss O'Neill, giving her views of this work. I have not asked her to do this as yet, but am making this an invitation now.

Now, I am going to ask a few questions. In the first place I want to know how many of you feel better and stronger; how many feel that you have been benefited? Those who do may stand. If you do not feel that you have been benefited you may remain seated. (Unanimous response; all standing.)

I know several times during the past year you have felt that it was quite a sacrifice to come here and take the tests. Now, I would like those of you who do not feel that you will be inclined to take the rest of the tests to please stand. (No response.)

Those of you who will go ahead and finish these tests and the work expected of you for the remainder of the year, please stand. (Quick response by every member.)

One more question—When we came before the class we told you what we hoped to accomplish, and for that reason asked you to take up and do certain things. We stated that it would make you better, brighter and stronger boys and girls. Inasmuch as you were not convinced of this and inasmuch as we could not make the fathers and mothers of the boys and girls see this, we made this little offer of five dollars in gold to each one of you. Aside from the five dollars how many boys and girls feel that if we could have made you know how much good would have been accomplished, you would have been faithful to this work? (All responded by standing.)

Miss C. O'Neill, Principal of Marion School--I want to say that in every case there has been improvement, and in several cases there has been a very marked improvement.

While their general conduct, their appearance has improved, their feeling of self-respect has increased. All those things that tend to a better life. Things that you cannot show in per cents or in dollars and cents. I should have been very much disappointed if they had not responded, as we do not make the kind of children that are not going to be faithful to a trust.

At this point the presentation of the five dollar gold pieces was made; Mrs. Van Gastle, the dental nurse, calling the roll, each child passing Dr. Barnes and Dr. Owens for examination of their mouth and then going to Miss O'Neill to receive their reward.

Dr. Ebersole—How many of you would like to go before the National Dental Association and show the result of this work? (All responded by standing.)

Miss O'Neill made the statement that several of the children (in this holiday season) made presents of tooth powder and tooth brushes to their teachers.

Dr. Ebersole—If the class is faithful up to the end of the year I am going to ask Miss O'Neill to write a paper to read before the National Dental Association next July.

Miss O'Neill promised to do this if the class would remain faithful and would be there to hear the paper, which they readily agreed to do.

STERILIZATION OF INSTRUMENTS

By B. Holly Smith, Baltimore, Md.

Our instruments when used in any one case should be washed with brush and soap, steeped in formalin solution, and then be passed with forceps to a tray of alcohol. This is sufficient sterilization in all cases except when handling specifics, then the sterilizer with its soda solution may be brought into requisition. Surgeons are finding that the temper of a blade is never improved by the formerly accepted plan of sterilization, and many are resorting to mechanical means of cleansing instruments, to be followed by the alcoholic bath. This has been found to be effective, and it is the most satisfactory method for the dentist. *Dental Cosmos.*

CAST GOLD INLAYS

By Calvin W. Knowles, San Francisco, Cal.

In using occlusal gold inlays, the operator will find that a piece of rubber dam just large enough to cover the wax model, placed between the occluding teeth while the wax is soft, will make the articulating surface of the inlay occlude exactly, and there will be no grinding to do when the inlay is finished and polished.—*Dental Cosmos.*

FLEXIBLE VARNISH

A quick drying, flexible varnish is made by adding to copal varnish from one-half to one per cent. of castor oil. To a pint of varnish from one-half to one fluid dram may be added. This varnish will dry with a splendid gloss, and the castor oil keeps it pliable.—*Work.*

CORRESPONDENCE

KEEPING DENTAL RECORDS.

By C. W. Benson, D. D. S., Duluth, Minn.

AFTER reading the article by Dr. A. D. Black, which appeared in your December issue of The Dental Summary, I cannot refrain from writing an endorsement of his ideas, and at the same time mentioning some features in my own method which I find of great help in keeping records of treatments.

I have for some time made it a practice to use examination blanks so that it will be unnecessary for me to hunt for the next tooth that needs attention. These blanks when filled in are placed upon a clip board and as soon as treatment of a tooth is begun I make note of the date, number of tooth in accordance with that particular diagram, and also the medication which is applied to that tooth.

Arsenical applications are always written in red, subsequent removal with date of removal is recorded, and as I nearly always seal in a dressing of Dr. Buckley's modified phenol before root or roots are filled, I also note that.

Where formocresol is used I often find it necessary to use more than one application, in fact nearly always. In these cases it is both interesting and necessary that the progress of the treatment should be noted.

I have in some instances had to seal arsenic in two or three teeth and perhaps a formocresol treatment in teeth for the same patient on the same day, in the meantime, perhaps the next day, proceeded to prepare some other tooth for filling, and I must confess that with ten or twelve other treatments for as many patients, I would be puzzled without these records.

A patient will sometimes unavoidably break an appointment, and if you have a crown or bridge ready for her it is very easy to overlook an arsenical application in some other tooth.

I could go on and cite many more instances which would show that a record represents time well spent.

After every day's work I glance over my records and if anyone has broken an appointment which would result in an application of arsenic being left indefinitely in a tooth I make it a point to communicate with him on the following day and inform him of the facts.

My professional friends have thought this to be unnecessary, but when I find that such an able man as Dr. Black is doing the same, I feel that I am not so far out of the way after all, although I believe Dr. Black's records cover more, and, as I understand, they are made permanent.

EDITORIAL

HAS A SUPERIOR INSTRUMENT METAL BEEN FOUND?

STEEL in various forms has been the one metal that answers the requirements for instruments, and it has been so improved that today we have a material that holds an edge better than our tools of years ago. There is one serious objection, however, to steel as a metal for cutting instruments, especially those requiring disinfection, and that is its susceptibility to corrosion or rust. No matter how highly finished the instruments may be, constant vigilance is necessary to protect them from rusting.

Recently there has been found in an alloy of cobalt and chromium a metal which not only rivals steel in cutting qualities, but also possesses a resistance to atmospheric influences which is perhaps equaled only by gold and the metals of the platinum group. Ellwood Haynes, the inventor, describes this interesting alloy, which he has named "stellite," in *The Scientific American Supplement* of Nov. 19th.

It is apparently not yet in shape to be manufactured commercially, but has fascinating possibilities. In speaking of his experiments with the new alloy, Mr. Haynes says: "After some experimenting, I was able to produce metal that would forge out perfectly into thin strips, which showed no tendency to check. After cooling, these strips were as hard as mild-tempered steel, and could scarcely be scratched by a file. A kitchen knife-blade was made from this material, and used for all sorts of purposes, such as are known only to the culinary art. After two years of use, it showed not the faintest sign of tarnishing, and if held in the sun, it produced a reflection that would dazzle the eye.

"In color, the metal stands between silver and steel, and if suitably polished, it shows a high luster. A test was also made of the modulus of elasticity of the material, which was found to be fully equal to that of steel. These tests were made on one of the first bars produced, and I am pretty well satisfied that much higher results could now be obtained. . . . .

"Notwithstanding the great hardness of the alloy, it not only forges readily at a red heat, but can be bent at a right angle cold, either in the form of a cast or forged bar, provided the dimensions do not exceed one-fourth inch square. Its elastic limit is not quite equal to that of tool steel of the same hardness, but it is much tougher. Samples can also be made showing much greater hardness than those described above, but the breaking strain and elastic limit will, under these circumstances, closely coincide.

"Blades made from the alloy take a fine cutting edge, which is particularly smooth, though capable of excellent cutting qualities. A small chisel, about one-fourth inch square, will readily cut a twenty-penny wire nail in two, without marring the edge of the tool. A lathe tool made from the alloy with certain modifications, is capable of cutting ordinary steel at a very high rate of speed. A test was made against high-speed steel, and it was found that the stellite tool would cut a continuous shaving from the bar, at the speed of 200 feet per minute, while the high-speed alloy steel tools failed almost instantly. It does not of course follow from this that the alloy is better suited for high-speed lathe tools than good alloy steel, but simply that it will stand a higher speed without 'burning.' "

In regard to the chemical properties of the metal he says: "A brightly polished piece of the cobalt-chromium alloy is attacked slowly by cold, strong hydrochloric acid, and after the lapse of a few seconds, the solution shows a faint greenish tint. The action, however, does not become violent, unless the acid is heated, in which case it becomes somewhat vigorous. The more dilute the acid, the slower its action, and the alloy may be momentarily exposed to the action of the dilute acid without perceptible effect.

"Either strong or dilute sulphuric acid attacks the metal very slowly.

"Hydrofluoric acid also acts very slowly on the alloy, and its action seems to be similar to that of hydrochloric acid, though not so pronounced. With the exception of the above acids, the alloy is practically inert to all other chemical reagents. A polished piece may be boiled in nitric acid for hours without having its luster diminished in the slightest degree. The alloy may also be boiled in solutions of the caustic alkalies for an indefinite length of time without the slightest effect. It is likewise proof against all atmospheric influences, and will retain its luster under all circumstances, no matter whether the atmosphere is dry or moist, or even heavily laden with acid vapors, sulphureted hydrogen, or other corrosive gases."

Mr. Haynes further states that if suitably ground and polished the metal presents a beautiful white and lustrous surface, and while its color is not quite equal to that of silver, it is always permanent and agreeable to the eye. Combined with this permanence and beauty of finish, it possesses cutting qualities comparable to those of good steel. It also holds a permanent edge, and seldom requires sharpening.

"The alloy is also well suited for the manufacture of surgical instruments, since it is not at all affected by mercuric chloride or other sterilizing solutions which severely corrode steel instruments. It will also probably have considerable application in dentistry and watch making. For instruments to be used in the chemical or physical laboratory, it is the material par excellence. The writer knows from experience that it is a great satisfaction to have spatulas, scrapers, and other tools remain perfectly bright in the chemical laboratory."

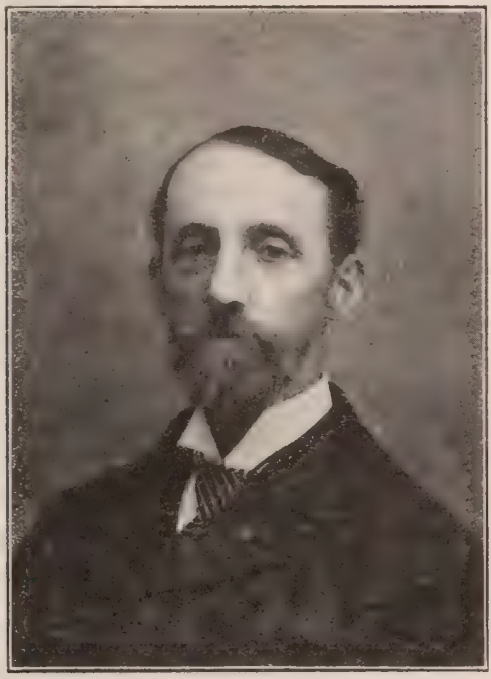
If these tests and observations prove correct, dentists have promise of a grade of instruments more nearly meeting their requirements than any yet produced.

OBITUARY

John C. Lyder, D. D. S.

In the death of Dr. J. W. Lyder, Northern Ohio loses another of her pioneer dentists. Dr. Lyder died at his home in Akron, Ohio, on Dec. 23, 1910, the cause of death being arterial sclerosis.

Dr. Lyder was born in Elkton, O., and received his preliminary education in the public schools and Oberlin college. He graduated from the Philadelphia Dental College in 1869, practicing for a time in Fairfield, then removing to Alliance, where he practiced until coming to Akron in April, 1875, where he has since had a continuous and heavy practice until his retirement about three years ago.



JOHN W. LYDER, D. D. S.

Dr. Lyder was prominent in dental society work, especially the Northern Ohio Dental Society, of which he was president during the years 1877, 1878 and 1879. He joined the Ohio State Dental Society in 1871 and was elected president of the society in 1883.

He served for several years on the Board of Dental Examiners of the state.

He was at one time president of the Stark County Agricultural society and from 1881 to 1883 was a member of the board of education in his city. He acted as eminent commander, Knights Templars for 1891. He was very fond of birds and spent many years collecting fine specimens.

Dr. Lyder was a kind-hearted and genial man and his friends were legion.

He is survived by a wife and two sons, J. W. Lyder, of Duluth, and Dr. F. H. Lyder, of Akron.

SOCIETY·ANNOUNCEMENTS

Odontological Society of New Orleans

At the annual meeting of the Odontological Society of New Orleans, held January 11, 1911, the following officers were elected to serve for the ensuing year:—E. L. Fortier, D. D. S., President; St. Clair Duke. D. D. S., Vice-President; Alred A. Leefe, D. D. S., Secretary-Treasurer. Executive Committee: F. H. Field, D. D. S., Chairman; T. J. Wingrave, D. D. S., E. B. Ducasse, D D. S.

Chicago Dental Society

At the regular meeting of the Chicago Odontographic Society held December 20, 1910, in the Chicago Public Library Building, the name of the society was changed from the Chicago Odontographic Society to the Chicago Dental Society, and the following officers elected for the ensuing year:

President, G. W. Dittmar; Vice-President, G. N .West; Treasurer, F. E. Roach; Secretary, T. L. Grisamore; Librarian, F. D. Coolidge.

Board of Directors elected: R. Beck, L. F. Bryant, L. E. Bake. J. P. Smith.

Board of Directors now stands: R. Beck, G. M. Gallie, one year; A. D. Black, L. F. Bryant, two years; J. P. Smith, L. E. Bake, three years.

Board of Censors: P. B. D. Idler, Chairman; H. C. Piesch, A. M. Hewett.

Organization Committee: W. H. G. Logan, Chairman; F. W. Gethro. R. J. Cruise.

Massachusetts Dental Society

The forty-seventh annual meeting of the Massachusetts Dental Society will be held May 11, 12 and 13, 1911, at Hotel Somerset, Boston A most interesting and instructive program has been arranged.

Progressive practitioners of dentistry residing in the State of Massachusetts, who are not members of the Massachusetts Dental Society are cordially invited to membership. Charles W. Rogers, Secretary, 165 Harvard Street, Dor., Boston, Mass.

Iowa State Dental Society

The forty-ninth annual meeting of the Iowa State Dental Society will be held at Des Moines, May 2, 3, 4, 1911.

This will be the largest and best meeting ever held by this society. A great effort is being made to BOOST the membership to 1,000 for 1912, at which time we will have our fiftieth annual meeting and propose to celebrate accordingly. W. G. Crandall, Secretary, Spencer, Iowa.

Southwestern Nebraska Dental Society

The seventh semi-annual meeting of the Southwestern Nebraska Dental Society will be held at McCook, Neb., Thursday, February the 23d. Fine program has been prepared for this meeting consisting of clinics and papers by three men from outside the district and plenty of home district talent. W. A. McHenry, Secy.

Southern Branch National Dental Association

The Southern branch of the National Dental Association will meet in Atlanta, Ga., April 4th, 5th and 6th, at 10:00 a. m. Headquarters will be at the Piedmont Hotel. All business sessions will be held there, and the Manufacturers' Exhibit also.

The railroads have given the following rates: a fare and one-half plus 50 cents in all territory south of the Mason and Dixon lines, and east of the Mississippi, provided there are two hundred in attendance who traveled by rail. Those living outside of this district will please communicate with the Corresponding Secretary, Dr. W. G. Mason, Tampa, Fla., as to rates obtainable. The various committees are hard at work and the meeting promises to be an exceptionally good one. The time selected for the meeting is ideal in this section, and as it is well in advance of the commencement exercises, it is expected that we will have an unusually large attendance. A more complete announcement will be made in next month's journals, but it is well to make your other arrangements fit in with these dates.

St. Louis Society of Dental Science

The St. Louis Society of Dental Science has elected the following officers for the ensuing year: President, S. H. Voyles; vice-president, J. P. Marshall; treasurer, E. J. Lenzen; curator, J. C. Gault; secretary, Val. H. Frederich, Metropolitan Bldg. Executive Committee, Edward E. Haverstick, C. O. Simpson, G. H. Westhoff, J. C. Gault, C. S. Dunham.

RESOLUTION PASSED BY THE OHIO STATE DENTAL SOCIETY

The following resolution, offered by Dr. H. C. Brown, was passed by the Ohio State Dental Society at its recent meeting:

Whereas, There has been, for some time, a general movement relative to re-organizing the National Dental Association so that we may have a more representative organization, with an increased membership and wielding a greater influence. With this in view, the National appointed a Revision Committee at the 1907 meeting, consisting of Drs. J. D. Patterson, B. Holly Smith and S. A. Hopkins, which Committee was continued at the 1908 meeting. And

Whereas, The following resolution was adopted at the 1910 meeting:

"Resolved, That the Committee of Revision of the Constitution and By Laws be continued and that Drs. R. Ottolengui and H. C. Brown be added to the Committee and that the Committee be directed to request the President, or a representative to be appointed by him, of the various State Associations, the Faculties' Association, the Examiners' Association, The Dental Educational Council and the Dental Faculties' Association of American Universities, to a conference to be called at the pleasure of the Committee for the purpose of considering a Constitution and By-Laws for this Association and to report thereon at the next annual meeting." Therefore, be it

Resolved, That the Ohio State Dental Society, in session Dec. 6th, 7th and 8th, 1910, most heartily endorses this movement and authorizes the President to appoint, not only a representative, but also an alternate, and be it further

Resolved, That this Society expresses itself as favoring a plan whereby members of a State Society, or such Local Societies as may be approved by the Executive Committee of the National, may individually become affiliated with the National, with annual dues not exceeding two dollars ($2.00). And be it further

Resolved, That our representative shall first direct his efforts in accordance with the foregoing instructions, but in order to make possible a harmonious and successful termination of this long discussed subject, he is authorized to act and vote as may in his judgment seem advisable in formulating a Constitution and By Laws, which will permit of the National Dental Association reorganizing under a broad and equitable plan and publishing a National Dental Journal, and reporting the results to this Society at the next annual meeting. And be it further

Resolved, That the Secretary transcribes this resolution upon the minutes and mail copies to the representative and alternate appointed, also a copy to the Secretary of the Revision Committee of the N. D. A.

AVOID IF POSSIBLE THE EXTRACTION OF TEETH FOR PATIENTS EXPOSED TO MUMPS

Four days after the extraction of the roots of a lower first molar, the patient developed a case of mumps, and two days later, when the inflammation of the disease was at its worst, excessive hemorrhage occurred from the wound.

A NEW RICHMOND IN THE FIELD

The initial number, January, of "Oral Hygiene," published by Lee S. Smith & Son Co., Pittsburg, Pa., has reached this office, containing much of interest to all who recognize the value of the great campaign for the education of the masses along dental lines now getting well under way. The new magazine contains eighty pages, of a size convenient for the coat pocket, and is devoted primarily to the spread of the doctrine of oral hygiene, as indicated by its title. The editor is George Edwin Hunt, M. D., D. D. S., dean of the faculty of the Indiana Dental College, who is particularly well qualified for the post on account of his connection with the Indiana Dental Journal, deceased, a very clever writer on dental topics. Oral Hygiene will be mailed to any dentist who cares to ask for it, free of charge. There is plenty of work for such a magazine, and we believe that the publishers of Oral Hygiene are able to do it well.

NEWS and OPINIONS

TO WHOM IT MAY CONCERN

We have received two circulars concerning the Taggart Process controversy, which are printed in full below:

Circular No. 1.

DENTAL PROTECTIVE ASSOCIATION

AGREEMENT WITH DR. W. H. TAGGART.

The Dental Protective Association of the United States was organized by Dr. J. N. Crouse, of Chicago, in 1888, when it was quite common for patent claimants to collect unjust and exorbitant royalties from the members of the Dental Profession. Since this Association was organized it has succeeded in preventing patent claimants from abusing the Profession, and its strength and influence is recognized by all who are familiar with its history.

About four years ago Dr. W. H. Taggart, of Chicago, described by means of papers and clinics, a new and original method of making inlay fillings. Briefly stated, the method consists of making the inlay in wax and reproducing the wax inlay in gold or other metal by a casting process. Since the introduction of the so-called Taggart Method, the practice of dentistry has been in a large measure revolutionized.

Dr. Taggart is now the owner of certain United States letters patent and applications for United States letters patent relating to the Method and Apparatus for casting inlay fillings according to this method; and he has brought suit against at least one member of the Profession and has threatened the members of the Association with litigation based upon the alleged infringement of said letters patent.

The question arose as to what action the Association would take in case any of its members were sued for alleged infringement. To engage in a long series of litigation is as unsatisfactory as it is unprofitable for all concerned. Let it be understood that the Dental Protective Association was organized to *prevent abuse* of its members, not to defraud any man of his just due. Dr. Taggart has offered to sell his machine for casting, including the permission to use the Method, for $110.00, or the permission to use the Method alone for $50.00. Was this an abuse of the Dental Profession? Many dentists, including Association members, felt that it was not and at once purchased Taggart's machine, others felt that Dr. Taggart was asking too much, since the process could be carried out successfully with a less complicated and therefore much cheaper machine.

Every dentist realized the value to him individually of the Taggart Method; and it can be said that most practitioners felt that they were in some way indebted to Dr. Taggart. How much in money value they were indebted, and how the debt could be liquidated, were points which did not seem to be clear in their own minds. Therefore, the Board of Directors of the Association was urged to take the matter up with Dr. Taggart and see if amicable terms could not be made by which its members, present and prospective, could practice the Method with the machine they were now using without danger of litigation. The Board took the matter under consideration and caused an investigation to be made respecting the validity of the Letters Patent, and after being convinced that the same would probably be sustained in whole or in part if litigated, concluded that if a compromise agreement could be effected between the Association and Dr. Taggart a threefold object would be accomplished.

First. The members of the Association, both present and prospective, would be protected, without litigation, in case Taggart succeeded in validating his patents.

Second. It would afford an opportunity of banding the Profession together into a strong and permanent Protective Association.

Third. It would give Dr. Taggart, without litigation and without a hardship on any dentist, a just and reasonable compensation for his valuable invention.

It is with a great deal of satisfaction, therefore, that we are able at this time to announce to the members of the Association and to the Profession at large that an agreement in writing was entered into between the Board of Directors and Dr. Taggart, and the same was duly signed and delivered on the 5th day of December, 1910.

The terms of the agreement are such that any member of the Association in good standing can secure the present Taggart machine for the cash sum of Seventy-five ($75.00) Dollars, including the permission to use the Method, or he can obtain the permission to practice the Taggart Method alone for the life of the patents (17 years) with any machine he may now be using for the cash sum of Fifteen ($15.00) Dollars, provided the amount is paid before the entry of any decree or judgment finding Taggart's patents valid or granting damages for infringement.

The agreement further provides that any member of the profession who joins the Association within the time above specified can also secure such permission on the same terms.

The fee for membership in the Association is Ten ($10.00) Dollars. It will be seen, then, that for $25.00 any member of the Profession can obtain membership in the Association and the permission to use the Taggart Method. The Board of Directors feel that this is a just and fair proposition for all concerned, and they earnestly hope that the members of the Association, both present and prospective, will realize and appreciate the delicate situation with which we were confronted and accept at once the terms of the agreement. We ask you to carefully read the accompanying amended By-Laws and trust that you will immediately sign and return the same, together with your check, to the President, Dr. J. N. Crouse, 2231 Prairie Ave., Chicago.

Signed

J. N. Crouse,
C. N. Johnson,
J. P. Buckley,
Board of Directors.

Circular No. 2.

THE CROUSE-TAGGART DEAL.

PERVERSION OF THE DENTAL PROTECTIVE ASSOCIATION.

Washington, D. C., January 6, 1910.

Dear Doctor:

Referring to a recent circular letter to the profession entitled "Dental Protective Association Agreement with Dr. Taggart," which letter wishfully requests members of the dental profession to "read the accompanying *Amended* By-Laws," and "immediately sign and return the same together with your check," and to pay Taggart "before the entry of any decree or judgment finding Taggart's patent valid," I, as chairman of the committee conducting the defense for the profession in the Taggart test suit, respectfully ask your attention from another viewpoint.

The Dental Protective Association collected large sums of money under the alleged chief object of defending "any of its members in any of the States or Territories when prosecuted for the infringement of patents the validity of which has not been fully established."

But, first conceiving and entering into an agreement with Dr. Taggart by which the Dental Protective Association would share with him the pecuniary benefits to be derived from the third party—the dental profession being made the third party without its knowledge or consent—the next move in the scheme was to so change and pervert the stated object of the D. P. Association that it might appear to have authority to use its funds, its influence, and its machinery in affiliation with the patentee for the collection of license fees for the use of the Taggart process patent. This being accomplished, a la Crouse, the next move in the scheme was the sending out of the circular letter which expressly states the object of making collections of license fees *"before the entry of any decree or judgment," etc.*

Your mind should now revert to the fact that about three years ago Dr. Taggart entered suit under circumstances that then appeared to be a sincere attempt to test the validity of his patent and the profession was forced, by reason of his exorbitant demands and extraordinary claims, to join with him in the test. But Dr. Taggart delayed the progress of the suit while overtures were being made from some to others of his friends and finally negotiations were concluded with his neighbor, Dr. Crouse of the

D. P. Association. The unseemly and undue delay impelled the court to issue an order in behalf of the defense which compels the plaintiff to close his case next month (February). Therefore, notwithstanding this extraordinary interpolation and unseemly interference with a pending suit, the defense in behalf of the profession will be continued to the only legitimate end, a final decision, and without the least taint of compact or alliance with any interest.

Neither the Committee nor any of the many members of the profession supporting the defense have the slightest personal prejudice nor the least objection to any payment to Dr. Taggart that may be made by any one of those who Dr. Crouse, at this late day, comes out and says "felt they were in some way indebted to Dr. Taggart." But there is objection to Dr. Crouse, acting in behalf of the Dental Protective Association, and of Dr. Taggart, interfering with a pending suit, and representing to the profession that the validity of the patent will probably be sustained in connection with an implied threat and a direct request for the immediate signing and returning of the *amended* by-laws, together with check for the payment of Dr. Taggart "before the entry of any decree or judgment" in this case.

Dr. Taggart did not seek, so far as we know, an amicable and equitable settlement with the defendant profession. He selected the nominal defendant and the jurisdiction best suited to his purpose and forced the beginning of a suit that called for a defense in behalf of the profession in general.

Scores and hundreds have joined the committee in the difficult task of raising funds to meet the necessarily heavy expenses of taking testimony in various States, but the interest of the profession has not and shall not suffer because of the difficulty of raising much needed funds. The defense is and all the time has been anxious to reach a conclusion. The plaintiff delays while negotiations are carried on for the purpose of giving Dr. Crouse control of more money that may be used to prevent the testing of the validity of patents which are granted by the Patent Office without a contest in the routine procedure of that office. The condition of the profession would be deplorable if there were no opportunity for testing the validity of patents granted after a hearing of only the patentee. What the condition will be if our associations, organized and supported for the sole purpose of testing the validity of patents, pervert their objects and seek to involve the profession and embarrass its defenders in pending patent suits, we leave to you to judge. But of this be assured, the recent order of the Court compelling Taggart to close his case next month, will give us the opportunity we need to force the case to an early adjudication. We have the utmost confidence in the judgment of our lawyers who assure us that the defense is more than abundantly sufficient to win a verdict for the profession and to save it from the yoke of a process patent and an office license of the Goodyear-Patent kind. Send Crouse and Taggart "immediately" all the checks you wish before the suit is decided by the Court, but don't do so with the idea that the defense conducted in your behalf lacks in evidence, in common sense or in legal talent. The defense committee lacks nothing but money with which to force the plaintiff to submit the insufficient evidence on which his case rests, but in some proper way will meet the expense.

Do a little thinking for yourself on Crouse's propositions. If the validity of the Taggart patent will probably be sustained, why does the plaintiff have to be forced by the defense, after about three years, to submit his case? And why has the plaintiff come down from the exorbitant demands to the meager sum for which he negotiates through his neighbor, Dr. Crouse? Would not the value of the patent and license to use the method incr^ase with the near approach of a verdict sustaining the claims of the patentee? And, again, why did our great defender against patents "the validity of which had not been fully established" go off for years on a Rip Van Winkle sleep while the profession has been strenuous in taking evidence in various States on which the Court will reach a decision Dr. Crouse now seeks to forestall? And, further, why should Dr. Crouse seek and claim to have legally secured a far-reaching perversive change from the objects and purposes for which the fees we have paid the Protective Association may be used?

The profession's defenders in this case are not seeking a compromise nor affiliation with any patentee or organization but are using every dollar the committee can raise to speed the day when this case will be decided on its merits as shown by the evidence in the case, and be assured no fear need be felt because of the evidence so far recorded.

Fraternally,

Mark F. Finlay,
1928 I St., N. W.,
Chairman, Committee for the Defense.

RESULTS

Under this head we shall print from time to time reports of the establishment of dental inspection in public schools, free dental clinics and other news from the field of dental education as the work goes on. We shall thank our readers if they will keep us fully advised of all developments in their locality.

DENTISTRY AT THE CHILD'S WELFARE EXHIBIT, BROOKLYN

An Educational Exhibit Witnessed by Thousands Daily, that is Sure to be of Immense Benefit.

(*Special Correspondence.*)

Brooklyn, N. Y., January 20.—The Child's Welfare Exhibit opened January 18, at Seventy-first Regiment Armory, 34th street and Park avenue. The exhibit is intended to illustrate the economy of concentrating efforts for human betterment upon the children, lessening the social waste and financial burden that rests upon the charities and reformatories of today.

Among the more interesting exhibits is a model dental clinic, prepared by Dr. A. M. Nodine, giving cost of equipment, cost of operation, the number of patients that can be treated, the diseases that are aided and abetted by decayed teeth, directly and indirectly, their influence on the general health, the dangers of this influence on the mental, economic and esthetic welfare of the child, etc.

This is the largest and most important exhibit of the kind ever held, and, from a dental standpoint, it will arouse a very great deal of interest.

The Second District Dental Society of the State of New York secured the space for the model clinic and equipped it completely, showing, among many other interesting things, the following:

Method of recording cases by the use of Dr. Nodine's model one-card system and infirmary book; photographs of other clinics; complete enamel equipment, glass bottles, etc.; plan for the establishment of model school clinic; also, for training school for dental trained nurses, including two chairs for two graduate dentists and ten chairs and ten trained dental nurses, the dentists to examine, fill and direct, and the nurses to clean the teeth of the children, and teach them how to take care of their teeth to prevent decay.

The estimated cost of the installation of such a clinic, including salaries of dentists and nurses for the first year, is between twelve and fifteen thousand dollars, and its capacity would be the cleaning, treating and filling of 2,400 children's teeth per month.

The nurses are first to be trained in the offices of some of our leading dentists and then placed in the training school prepared for them.

The exhibit is visited by thousands every day, and the object of oral hygiene generally and school dental clinics in particular, is being given such attention as it never before has received.

It is the hope to interest some philanthropists and secure subscriptions for the accomplishment of our plans in the near future.

Around the walls are three immense screens, 12x4 feet, upon which, in large, plain letters, appears the following:

(Screen 1.)

DECAYED TEETH

Are the Port of Entry for Half the Infections of the Body.

Disease Germs Lodge in the Cavities and Between Unclean Teeth.

BAD TEETH PRODUCE

1—In the Mouth:
    Decaying Matter,
    Growth of Disease Germs.
2—In the Throat:
    Tendency to Catarrh,
    Tonsilitis—Croup—Diphtheria.
3—In the Nose and Ears:
    Adenoids—Mouth Breathing,
    Ear Ache.
4—In the Face—(Bones—Glands):
    Abscesses—Swollen Glands—
    Tuberculosis.
5—Through the Nerves:
    Neuralgia—Eye Spasm.
6—In the Stomach:
    Indigestion.
7—Throughout the Body:
    TUBERCULOSIS.

Many Sanitoriums for Consumptives will not take Patients with Decayed Teeth.

TOOTH-ACHE.

Means Much Pain and Danger of Forming a Drug Habit.

(Screen 2.)

Sound Teeth Help Boys and Girls Win Success in Life.

Sound Teeth Help PHYSICALLY by Aiding Digestion and Assimilation.

Sound Teeth Help SOCIALLY
    In Sweet Breath.
    In Good Looks.
    In Clear Speech.

Sound Teeth Help FINANCIALLY
    By Saving Dentists' Bills.
    By Saving Physicians' Bills.
    By Saving Time, Strength and Trouble.

A SPRAY BOTTLE CONTAINING

LISTERINE

IS ONE OF THE MOST DESIRABLE ADJUNCTS
TO THE DENTAL CABINET EQUIPMENT

THERE is no other antiseptic available that is comparable to Listerine in those pleasing characteristics of odor and taste which make its use so agreeable to the patient while securing for the practitioner the antiseptic influence that may be required.

An ex-president of the American Dental Association, writing to the manufacturers of Listerine, says: "The more I use Listerine the better I like it. I use it after any surgical operation in the mouth as an antiseptic wash, prescribing Listerine one part, water ten to twenty parts. After nearly all protracted operations in the mouth, I offer as a gargle and mouth-wash twenty to thirty drops of Listerine in half a tumbler of water, and find that it leaves the mouth in a delightfully cool and pleasant condition, and promotes healthy granulation of lacerated or bruised tissue."

THE DENTIST'S PATIENT

A leaflet designed to convey useful information respecting the care of the teeth. Supplies of this interesting treatise on oral hygiene are furnished free of expense to dental practitioners for distribution among their patients. A specimen copy, together with an order-form, will be sent upon request.

LAMBERT PHARMACAL COMPANY
LOCUST AND TWENTY-FIRST STREETS, ST. LOUIS, MISSOURI

Be assured of genuine Listerine by purchasing an original package

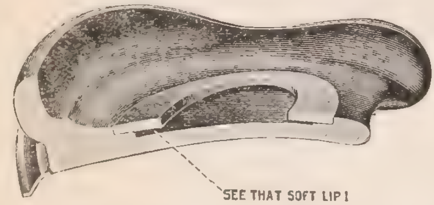
WE, THE makers of Antiphlogistine, stand to lose should we make any claim which is not strictly in accordance with the facts. You, the dentists, are both judge and jury, and we can't get away from the verdict.

When we state, therefore, that Antiphlogistine may be safely used on the outside of the cheek in a case of alveolar inflammation, without fear of causing an abscess which will break on the outside, you can depend upon it that our statement is backed up by clinical experience.

This being the case, can any dentist afford not to give it a fair trial?

The Denver Chemical Mfg. Co.

New York



The Perfection Suction

For Upper Plates

The old original and most successful suction—no discs or collar buttons to fool with.

Two dollars per box of nine suctions for nine plates, with easy and simple directions for inserting. All jobbers or

DENTAL SUCTION CO., Loudonville, Ohio

ALL INLAY INVESTMENTS WOULD BE BETTER IF THEY SET HARDER—

"STANDARD" SETS HARDER THAN THE REST

It is also more completely FIREPROOF, taking and holding the finest lines. Sufficiently expansive to compensate for shrinkage of metals in cooling. Does not crumble. Try a small box; sample if you like.

Sound Teeth Help in Business and Professional Life
- To Secure Better Positions
- To Enter the Army and Navy
- To Enter Fire and Police Departments.

Dental Clinics Care for Your Teeth Free or for a Small Fee Teach You How to Care for Your Own Teeth.

(Screen No. 3.)

BAD TEETH HANDICAP NEARLY HALF A MILLION SCHOOL CHILDREN IN NEW YORK CITY ALONE.

To Have Diseased Teeth Means Absence from School and Slower Promotion.

Because they interfere with:

1—Digestion:
- Food is not Properly Masticated.
- Food is Swallowed in Masses.
- The Juices of Digestion Act Insufficiently.

2—Growth and Weight:
- Both are Retarded Through Mal Assimilation.

3—Stamina:
- Malnutrition Causes Sickness.

4—Mental Development:
- If Body is ill-nourished, Mind cannot do its best work.

CHILDHOOD IS THE TIME FOR SPECIAL CARE OF THE TEETH.

Because:

If the first set of twenty temporary teeth is neglected the Permanent set of thirty-two teeth must surely suffer.

Brooklyn, N. Y., Jan. 12.—Dr. Rodriguez Ottolengui, president of the Second District Dental Society of the State of New York, covered the following points in his lecture before the Brooklyn Institute this evening on "The Duty of the State to the Child with Particular Regard to the Health of the Child and the Economic Value of Sound Health and Sound Teeth."

It is the duty of the State to safeguard the health of school children. A clean tooth never decays; an unclean tooth always decays. Decayed teeth prevent proper mastication of food and also harbor dangerous disease germs. Therefore, decayed teeth are a direct cause of ill health and a lack of resistance to infectious disease. A child carrying infectious disease germs in an unclean mouth and in the cavities of his decayed teeth is a menace to his companions. Ill health due to decayed teeth prevents a child from learning his lessons through inability to study. This results in his being "left back" in his class and each child so left back is an expense to the taxpayers of $65 per annum. A child's teeth and mouth can be kept in thorough order for much less than $65 per annum. Consequently, it would be cheaper for the State, cheaper for the taxpayer and better for the children if the State should maintain clinics for the care of children's teeth. The lecture will be Dr. Ottolengui's contribution to the widespread agitation now going on in favor of the establishment of dental clinics here that shall equal those found in many of the cities of Europe and in some of the cities of the United States.

Port Chester, N. Y., Jan. 10.—The Woman's Club has opened a dental clinic which will be conducted by the Civic Section of the club, of which Mrs. Mary E. Meade is chairman. A room has been equipped for the purpose and local dentists have agreed to give their time without charge. Tickets will be distributed among clergymen, teachers and others to be given to those in need of attention. On January 27 a whist will be given by the Civic Section to aid the work.

Providence, R. I., Jan. 10.—Dr. James C. Colton has been appointed dental inspector for the public schools. Dr. Colton for the past two years has been greatly interested in a plan to improve the condition of the teeth of the children of the public schools, an investigation by him a couple of years ago under the supervision of the late Superintendent of Schools showing that 96.6 per cent. of the children had decayed teeth and that 46 per cent. had aching teeth.

Dr. Colton's work will be to inspect the teeth of all children who have their first permanent teeth and he will notify the parents of those whose teeth are found in need of care to have the work done. The inspection is being done in other cities and authorities agree that much of the poor work done by pupils is due to the condition of their teeth.

Dr. Colton is a member of the Rhode Island Dental Society and is assistant dental surgeon at St. Joseph's Hospital.

Watertown, N. Y., Jan. 10.—At the meeting of the Jefferson County Dental Society, which was held last evening, an offer from W. H. Moore to furnish and equip a dental room in the building which is used for a free tuberculosis dispensary by the Visiting Nurses' Association, was accepted. The room will be entirely separate from the dispensary and will be equipped with the latest dental appliances. It is estimated that the expense of equipment will be upwards of $1,000.

The object is to provide those who are financially unable to have their teeth properly cared for, especially school children, with the best dental services available.

Pittsburg, Jan. 13.—A system of dental examination and treatment for all school children will be established in the public schools in the near future, under the direction of the Odontological Society of Western Pennsylvania. Plans for the new work are already under consideration. It is planned to have a dental chair in each school, to have regular visiting days, and to inspect the teeth of every pupil.

Leading members of the society, which is composed of the leading dental surgeons and practitioners of this part of Pennsylvania, have taken up the work and formed what is to be known as the "Section on Public School Dental Education."

Chicago, Jan. 12.—A campaign for the preservation of the teeth of Chicago public school children has been inaugurated through the establishing of a "chair of dentistry" at the Bowen High School.

A month's trial of the extension of free dental work to the pupils of South Chicago has proved highly successful. The Illinois Dental Society, through the direct supervision of the Chicago Dental Society, established the bureau there, and plans to extend the work.

The work of caring for the children's teeth was undertaken by the state dental society following the report of the Chicago Board of Health showing a prevalence of an alarming condition among the pupils. The health department's records showed that examination disclosed that in 1910 43,922 school children had bad teeth.

Buffalo, N. Y., Jan. 13.—The School Committee of the Board of Aldermen yesterday voted favorably on the recommendation of Health Commissioner Fronczak for free dental inspection in the public schools until "such time as the value of such services is recognized." The Buffalo Dental Association has had a committee visiting the schools and instructing pupils in mouth hygiene, and recently offered to provide two dental examiners and necessary assistants to care for the teeth of pupils. Not more than $50 will be needed for necessary supplies.

Governor Osborn, of Michigan has appointed Dr. G. F. Burke, of Detroit, a member of the Michigan State Board of Dental Examiners.

WHAT IS DOING IN THE SOCIETIES

The annual clinic of the Indianapolis Dental Society was held Monday afternoon, January 9, in the Indiana dental college and was followed by a banquet at the Denison hotel. Thirty of the most prominent dentists of the city and vicinity had charge of the clinics. Following the banquet a discussion on new methods was participated in by all present.

Dr. Martin C. Tracy, of New York, delivered an address on Cast Restorations before the American Academy of Dental Science at Young's Hotel, Boston, January 4.

What was at once the regular January meeting and the thirteenth annual session of the Reading, Pa., Dental Society, was held Jan. 5.

The Free Dental Dispensary Board submitted its report for the six months ending Jan. 1, when the new fiscal year of the society begins. It showed that there were 1,256 operations; that the patients number 112—102 new and 10 returned, and of which 76 were females and 36 males.

John T. Bair, D. D. S., the retiring president, reviewed the work of the society during the past year, after which the election for officers was held. The following were chosen: President, George F. DeLong, D. D. S.; vice president, Milton U. Gerhard, D. D. S.; secretary, Clarence B. Grim, D. D. S.; treasurer, Harry L. Cleaver, D. D. S.; dispensary board (3 years), George S. Schlegel, D. D. S, and Charles E. Grim, D. D. S.

The dentists of Hartford, Ct., have entered into an agreement that they will close their offices on Monday, Thursday and Saturday evenings and Thursday afternoons until further notice. Heretofore they have been in their offices day and night.

Dr. G. V. Black Honored

Brooklyn, N. Y., January 10.—Dr. G. V. Black, of Chicago, was the guest of honor last night at a dinner given under the auspices of the Second District Dental Society, at the Union League Club. Dr. Black was given an enthusiastic welcome. The members of the First District Dental Society of Manhattan turned out strong to aid the members of the local organization in giving the guest of honor a reception he will not forget for some time to come. The Central

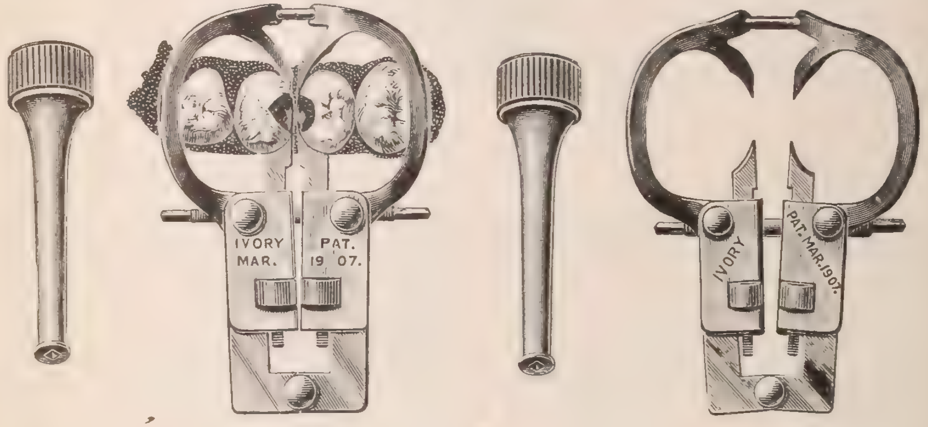
The One BEST

Into every can of SOZODONT TOOTH POWDER there enters 64 years of experience and wholesome effort to provide the one safe and reliable dentifrice to perpetuate the results of your own untiring efforts.

We offer SOZODONT Liquid-Powder-Paste.

Ivory's Adjustable Separator

Patented March 19th, 1907



THE jaws of each ½ of the separator working independently allows for the difference in the size of the teeth, gives a wide range for the adjustment of the jaws where the teeth are irregular, and a perfect control over the jaws so that they need never interfere or cover the margins of the cavity. The spreading force is many times slower than the ordinary screw force, no binding of the screw is possible, and its action is the most powerful screw force known.

Because the control of the jaws is completed, the movement of the spreading force so slow and evenly divided and the sense of touch perfect, the pain in separating the teeth is reduced to the minimum. It is universal for all operations extending beyond the first molars working on either side of the arch by changing the thumb nut.

PRICE FOR EACH $5.00

J. W. IVORY, 21=23 N. 13th St., Philadelphia, Pa.

Dental Society of New Jersey sent a delegation also.

Between the courses the members of the active society entertained the guest of the evening with popular songs. The aged professor, who thinks it an "insult" to be called old, enjoyed the fun very much.

At the conclusion of the dinner, Dr. Black gave a lengthy lecture on dentistry. In introducing the speaker, Dr. R. Ottolengui, president of the society, said that Dr. Black declared he kept young by constantly walking and by taking some of the prescriptions he later talked about. Dr. Black said he thought the world of the local society and that was the reason he accepted their invitation to be the guest of honor.

At the annual meeting and banquet of the Peoria County Dental Society, held at Peoria, Ill., January 3, officers for the ensuing year were elected as follows: President, Dr. J. D. Nichol; vice president, Dr. A. T. Smith; secretary, Dr. C. M. Smith; treasurer, Dr. E. H. Peters; librarian, Dr. H. G. Smith.

The first annual dinner of the First District Dental Society of the State of New York was held January 14 at the Hotel Astor. The speakers were Dr. B. C. Nash, president; W. W. Walker, toastmaster; A. R. Cook, president of New York State Dental Society; S. G. Perry, H. J. Burkhardt, of Batavia, N. Y., and P. F. Hofheing, of Rochester.

M., N. H. and V. Union Meeting

Union meeting of the Maine, New Hampshire and Vermont Dental Societies will be held at the Fabyan House, Fabyans, N. H., June 27, 28, 29, 30, 1911. All ethical dentists are invited to be present. Further particulars will be announced later. Fred F. Fisher, secretary New Hampshire Dental Society.

The Miami Valley Dental Society held its last meeting on Monday evening, January 9, at the Becket House, Dayton, Ohio. Dr. Walter Sigfried, of Franklin, read a paper on gold filling which was ably discussed.

Albion, N. Y., Jan. 10.—(Special).—The Orleans County Dentists' Association, at its last meeting in Knowlesville, elected these officers for the year: President, Dr. John A. Hartman, of Albion; vice president, Dr. W. C. Wells, of Medina; secretary and treasurer, Dr. George P. Doolittle, of Albion.

A local society was organized January 9 at Fredricksburg, Va., with the following officers: Dr. J. F. Thompson, president; Dr. George H. Chewning, first vice-president; Dr. H. M. Eckenrode, second vice-president; Dr. J. P. Stiff, treasurer, and Dr. J. Garnett King, secretary.

The Dental Society of the Seventh New York District and the Buffalo Dental Association held a joint banquet January 10.

Dr. Thomas A. Phillips, of Buffalo, was the toastmaster. The Seventh District takes in all of New York State west of Rochester. Among the guests were Dr. A. R. Cooke, state president of the society; Dr. Beebe, of Rochester; Dr. O. W. Norton, of the business committee, and representatives from Niagara Falls, Lockport, Attica and other places.

The speaker of the evening was Dr. H. E. Friesell, dean of the Pittsburg Dental College. Dr. Friesell gave a technical talk dealing with general matters in connection with the profession. About 75 members were in attendance.

Port Huron, Mich., Jan. 7.—A meeting of the 7th district Dental Society was held at the Harrington hotel, Thursday evening, after which a stereoptican lecture was given by Doctor O. W. White, of Detroit, on "Nasal Breathing and Its Effects on the Occlusion of the Teeth." His paper was ably discussed by Doctor R. C. Fraser, of this city. The next meeting will be held February 2nd.

Wilkesbarre, Pa., Jan. 14.—The Dental Society of Luzerne and Lackawanna Counties has begun a crusade against dentists who employ non-registered assistants, and caused warrants to be issued today for the arrest of three dentists charged with employing persons not qualified and who were not registered. Two of them are accused of employing non-registered women assistants. It is the purpose of the Dental Association to enforce the law to the letter.

Providence, R. I., Jan. 11.—The Rhode Island Dental Society held its annual meeting for the election of officers at the Crown Hotel last evening and took action looking to laws which will curb practice by non-licensed dental operators.

Dr. James E. Heap, of this city, was chosen as president of the society, with Dr. M. W. Maloney, of Woonsocket, as vice president; Dr. Clarence C. Carr as secretary and treasurer, and Dr. Frank P. Gleason as librarian.

A joint committee representing the Rhode Island Dental Society and the Rhode Island State Board of Registration in Dentistry was appointed to draft laws affecting non-licensed practitioners.

The matter of men practicing under assumed names was discussed and the statement was made that the laws are not being enforced. It was pointed out that the society has to give bonds now for costs on every prosecution, and no protection is given the State Board if it demands to see the license certificate of a practitioner.

Several advertising offices, it was stated, are conducted under an assumed name, although the law requires that individuals or corporations doing business under an assumed name shall file a statement with state or city officials stating the real names of those actually carrying on the business, and for the making of this statement a certificate is presented. This certificate, it was shown, is kept in any part of the room, even in the safe, so that the public has no way of knowing with whom it deals.

Sedalia, Mo., Jan. 11.—Dr. F. G. Worthley, of Kansas City, delivered the principal lecture today to the Central Missouri Dental Society, which at the close of a two-day's session elected the following officers, and adjourned to meet at Tipton in January, 1912: President, Dr. C. E. Cline, Appleton City; vice president, Dr. H. A. Kress, Warrensburg; second vice president, Dr. Charles Swap, Boonville; secretary, Dr. M. L. Myers, Sedalia; treasurer, Dr. C. H. Weaver, Sedalia.

DEATHS

Dr. Lawrence F. Ray, St. Joseph, Mich., January 4, aged 33. Dr. Ray, although but a young man, had achieved a prominent position in his profession and community.

Mrs. Anna L. Layton, wife of Dr. Charles R. Layton, Rockport, Ky., January 6.

Dr. D. H. Black, Forest River, N. D., of pneumonia, December 29. He had practiced at Forest River for seventeen years.

Dr. G. S. Allan, seventy-four, New York, dropped dead in the Mountainside Hospital, January 16. His death was due to apoplexy.

Dr. H. G. Williams, Cabot, Vt., December 30, of pneumonia, aged 57.

INSTRUCTIVE EXPERIENCES
REPORTED BY ENTERPRISING DENTISTS

Lansing, Mich., January 3, 1911.

"*All-In-One*" is all right. I have not felt like putting on very much pressure in recommending the tablets simply naming one or two other dentifrices when patients would ask what was good, as well as giving the name of the tablets. A patient just went out who has been using the tablets ever since I spoke to her of them, some months ago, and her mouth surely is in good condition. It was bad enough when I started with it. When she told me she had been using the tablets, I made up my mind that they should receive stronger recommendation from me hereafter. Y............Z............, D. D. S

This patient thinks better of her dentist than she did before he recommended the tablets—don't you think? A distinct gain in reputation—and that's the only ethical advertising.

You Can Have the Same Experience

"All-in-One"
DENTAL S TABLETS
TRADE MARK

Samples for the Asking

Chicago, January 7, 1911

I have been experimenting with "*All-In-One*" Tablets on a tooth out of the mouth, badly incrusted with the hardest kind of tartar. The tartar has loosened from the tooth, and shows up finely. I made a solution of the tablets similar to that which would be used in the mouth, and I think the brush would have removed the tartar without scraping. Have other dentists try this also. W............T............, D. D. S.,

Names of writers gladly supplied to dentists who care to write for them. We shall be glad to have all dentists correspond with these gentlemen.

SANICULA CHEMICAL CO. TOLEDO, OHIO

THE DENTAL SUMMARY

The Magazine That Helps

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The Michigan State Dental Society
The Indiana State Dental Society
The Kentucky State Dental Society
The Louisiana State Dental Society
The West Virginia State Dental Society
The Northern Ohio Dental Society
The Northern Indiana Dental Association
The Eastern Indiana Dental Society
The Southwestern Michigan Dental Society
Odontological Society of Western Pennsylvania
The Lake Erie Dental Society

and Several Local Dental Societies.

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L. P. BETHEL, M. D., D. D. S., Editor-in Chief

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REGULAR CONTRIBUTIONS

REPAIR OF CEMENTUM IN RELATION TO THE TREATMENT OF ALVEOLITIS*

By M. H. Fletcher, D. D. S., M. D., M. S., Cincinnati, Ohio

MANY years ago Dr. William H. Atkinson, of New York, endeavored to induce repair in the sockets of teeth which were deeply affected with alveolitis, by sponge-grafting, a method of surgery then in vogue.

At that time, from 1885 to 1890, the discussion of the etiology and treatment of the diseases of the sockets of the teeth, was at a very high pitch, the name "pyorrhea alveolaris" being then, as it is now, strongly attacked by many as inadequate and misleading. The etiology and pathology and the question whether it should be considered a local or a constitutional disease were also hotly discussed. Since then the methods of treatment have changed very little.

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*Read in the Section on Stomatology, A. M. A., of which THE DENTAL SUMMARY is the representative organ for the dental profession by special arrangement with the Jour. A. M. Asso.

If, however, we knew all the causes and the actual tissues most involved in the repair we should better know how to treat the disease intelligently, and have a greater number of recoveries and those more complete. It is hoped the facts here to be presented may do something toward this desired end.

The wonderful recuperative powers of cementum have recently been brought to my attention with great force, and the result has been active research regarding this tissue. Such literature as I have been able to find about cementum and its relation to human teeth is confined to mere descriptions of its locality and histology but not of its necessities and uses.

Cementum is the bond of union between the teeth and bone, and seems much like bone in its recuperative and reparative powers. For one to know that under proper environment the cementum may and will reform, when it has been removed from a root or cut into grooves, should be a fact of much moment and value to those interested in the treatment of diseases of the sockets of the teeth and the surrounding tissues. The incident which encourages me to believe this to be true is as follows:

A year or more ago a young woman of 19 came to me for treatment. About four years previously she had lost the crown of the first lower molar on the right, by an attempt to have the tooth extracted. The crown had been broken at an angle quite below the neck so that the soft tissues, when they began to repair, lapped partially over the broken surface. On close examination the soft tissues were found to be adherent to the broken surface of dentin. This being very unusual, the roots were carefully extracted, the lump of soft tissue still adhering to the broken surface. The anterior root was decalcified, with some of the soft tissue still adherent. Sections were made from the root and adherent tissue (Fig. 1). It was found that the cementum had not only grown over and become adherent to the broken surface of the dentin but had partly filled the canal of one root from the top down, something after the manner of the growth of secondary dentin induced by abrasion from mastication. The formative membrane was still adherent to these surfaces (Fig. 2). The cementum was very much thicker about the end of this root than is normal in teeth of this age (Fig. 3). This, no doubt, was due to the disturbance brought about by the attempt to extract the tooth. Nodules of cementum on the roots of the teeth are very common in older persons and are called exostoses, but to find cementum formed on and adherent to a broken surface of ivory of a human tooth, much as it is on the roots, is a new phenomenon in biology to me, and is of so much moment to those interested in the treatment of alveolitis that I have spent much time in investigating the subject.

The specimens examined seem to show that if environment is made perfect in treating deep-seated cases of alveolitis we may have a normal restoration of tissue to a great extent if not to a full amount. In the language of the general surgeon, we can expect to have a healthy useful stump if we cannot have a completed organ.

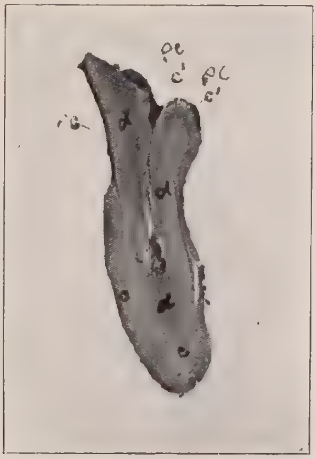

Fig. 1.—Section of anterior root of first molar (× 3); d, dentin; c, cementum growing on broken surface of dentin; p, c, pericementum; p, remnants of pulp chamber.

We all know numbers of cases in which teeth that, under treatment, have seemed hopelessly loose, in time have become firm and useful for many years; and I have wished many times that we might know just what the process of repair was. This one case of excessive growth and unusual attachment of the cementum to the broken surface of dentin teaches what this process of repair can be, and I am now convinced that it is the cementum on which we largely rely for the repair in these cases, it being the underlying factor of attachment. The specimens show excessive growth of cementum which must have been the result of some stimulating environment.

Cementum is of mesoblastic origin like dentin and bone; but bone seems to be one step too far away from dentin in physical character for perfect union between them to be possible, so that in the growth of teeth in vertebrate animals the cementum seems to have been a development by nature to supply the intermediate link as a bond of union between tooth and bone. Cementum is the natural product of the pericemental layer of the periosteum of the socket, and does not exist until the root of the tooth is formed. The presence of the dentin of the root in proximity to the periosteum seems to stimulate the layer of cells next to the dentin to bring into action that unknown law, the differentiation of cells, and cementum is the result. Thus it is seen that the periosteum of the socket is remarkable in that it forms bone on one side and cementum on the other, and at the same time acts as a cushion against the forces of mastication.

Since we know by the specimens that this membrane is capable of what seems unusual things, we can set our goal at having Nature reproduce much of the lost attachment in diseased sockets. The necessary conditions to produce this result would mean that we must have live tissue to live tissue as is done in setting a broken bone. Sterile blood-clot must fill the space between. To produce this condition the roots of the tooth must be surgically free from foreign matter. They can be cleaned by scraping and polishing, or, better, by planing the roots off with instruments like Thompkin's, Hartzells' or Carr's sets, which leave live tissue on the tooth side. All dead or diseased bone or other tissue should next be removed from the socket; this leaves live bone tissue on the other side opposing the live cementum, and if the wound be kept sterile by gently washing away the disorganized blood-clot at proper times, what would seem perfect conditions for repair will be produced, the space not being large enough to demand anything like sponge-grafting.

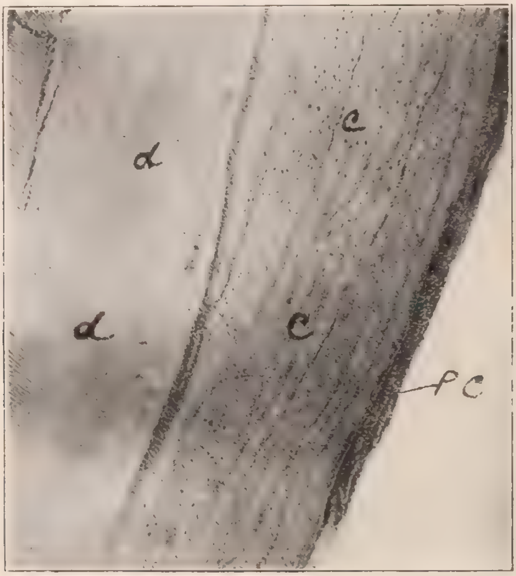

Fig. 2. - Normal cementum of the root (× 100) to compare with the cementum found on broken dentin and in root canal; d, dentin; c, cementum; p c, pericementum.

This condition no doubt existed in the case of repair here presented, that is, a broken surface of live dentin on one side and healthy cementum-producing tissue on the other side in close proximity, so that it could grow over the broken surface of dentin with the results shown. The cementum-producing membrane may come from above or below in the socket or from both directions.

If pus is found forming again, as it often is, either more thorough curetting or escharotic germicides such as pure lactic acid or iodin should be resorted to, in order to have Nature throw the strongest possible army of repair into the neighborhood. She will renew the effort, as often as called on, by making frequent fresh wounds in the socket. The principle is the same as that according to which setons were formerly drawn daily through a wound; but daily is too often in these cases. This treatment should fall short of destroying any repair which has already begun.

If the tissues are put and kept in normal condition for repair, as above described, healing will take place in due time, that is, in from two or four months, or in whatever length of time it would naturally take such wounds to heal—possibly a year or more in some cases. But the physician must know when the tissues are in proper condition for repair and how to produce them. It is understood that many patients do not come for treatment until they are beyond recovery.

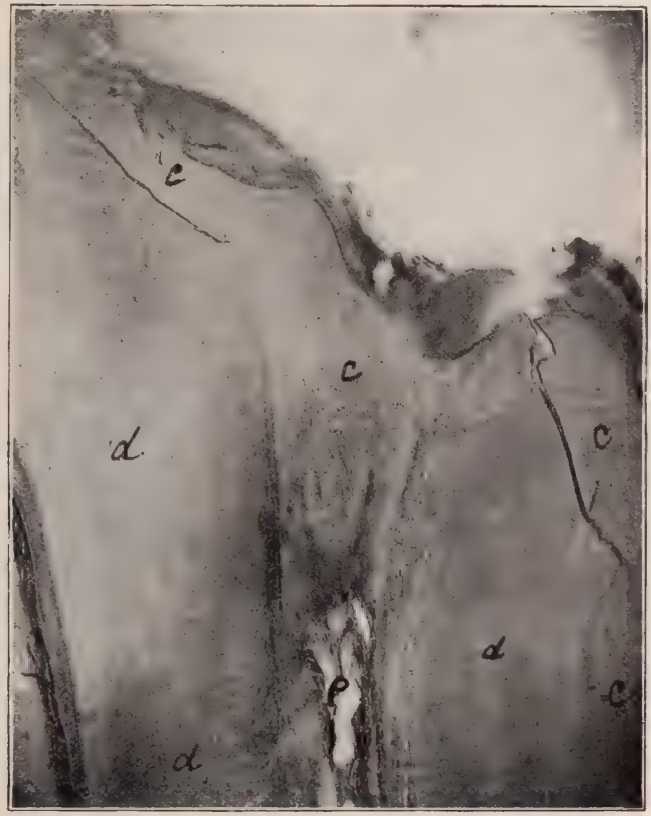

Fig. 3.—Top of Section 1 (× 75) showing cementum growing up over the side and onto broken dentin and into pulp canal; d, dentin; c, cementum; pc, remnants of pericementum; p, remnants of pulp chamber.

It seems to me that at present we proceed in the treatment of alveolitis without any definite idea of what processes are called into play in the healing; but we go ahead and do something; if the patient recovers, well and good; if not, we do not know why nor do we know what we should do in order to have Nature do the repairing which she is always trying to do and always will do if the physician is bright enough to know how to remove the hindrance in her way. Thus encouraged, Nature will accomplish what may seem wonders, but what to her is mere fulfilment of her own laws.

The facts as displayed in this case of repair certainly show a definite and encouraging goal for which to work and this goal is, I believe, the proper one; that is, we may look forward to the activity and reproductive power of cementum to form a new bond of union, knowing that this union will occur if the environment is made right. In bone surgery, it is not thought that the periosteum reproduces itself by growing edgewise to any great extent, but, surgically speaking, the reformation of enough periosteum and pericementum to line the whole tooth socket would not be considered a large amount to be reproduced. In cases of amputation of the apex of roots it no doubt is due to the cementum which covers the freshly cut surface that makes it possible for the tissues to retain the tooth in health instead of expelling it. Where roots may have been fractured repair may take place by the crevice being filled with cementum just as broken bone is cemented together by the fracture being filled with new bone.

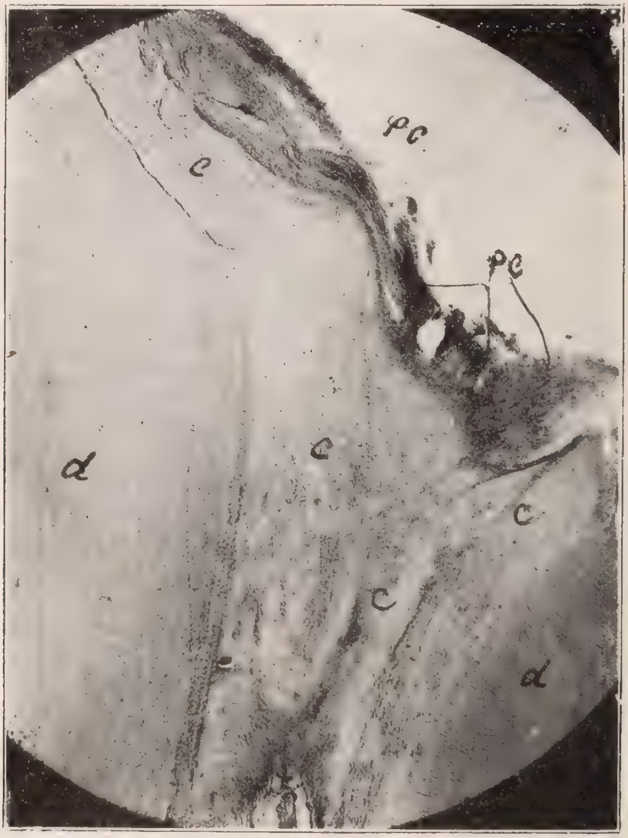

Fig. 4. Higher magnification of Figure 3 (× 100), showing more plainly the character of tissue; d, dentin; c, cementum; p c, remnants of pericementum.

Often arteriosclerosis, auto-intoxications or other systemic disorders hinder the healing of these wounds in the same manner as they hinder the healing of wounds in other parts of the body. If these conditions exist, they should be looked after either by the operator or the family physician, since the condition of the blood and blood-vessels have much to do with the susceptibility of the patients to alveolitis and to other diseases, as well as with the tendency to repair or to remain chronically diseased. So the systemic conditions must be looked after as well as those that are local.

Many patients suffering from necrotic and suppurative alveolitis are reported to have recovered under systemic treatment, but always after the deposits have been removed from the roots. From my point of view such patients recover on the same principle that tuberculous and other patients recover, that is, through such improvement in the patient's health by means of medical or climatic assistance that the system is equipped with sufficient additional material and vigor to overbalance and finally overcome the disease.

DISCUSSION.

Dr. Frederick Noyes, Chicago: For a long time I have been trying to teach that cementum was the means of attaching the surrounding tissues to the tooth, and that normal cementum continues to be formed as long as the tooth remains in function. A tooth that has just erupted has a few layers of cementum over the root. One that has been in use for a long life has a great many. Further, I have been trying to convey the idea that the tooth is continually moving as long as it is in function, and with every movement the attachment of the fibers to its cementum is cut off and they are reattached by the formation of a new layer of cementum. I think Dr. Fletcher will agree with me that these things which are physiologic facts occurring in the formation of every tooth are of prime importance in the consideration of this specimen, and that they are the foundation of the treatment of the roots of teeth in alveolitis.

The problem, then, which is presented to the practitioner in the treatment, for instance, of a deep pocket on the labial surface of the lower incisor where the normal attachment has been removed, is that of bringing the tissues in physiologic contact, and that is very far from an easy thing to do. If physiologic conditions can be obtained, the reattachment of the soft tissues to the surface of the root is the only logical thing to be expected. I would like to ask Dr. Fletcher if any of those broken fragments of dentin showed any formation of cementum?

Dr. H. M. Fletcher: They are enclosed in cement, and yet in most of them you can see an attempt at absorption.

Dr. Noyes: That question was suggested to me from the emphasis of Dr. Fletcher on its being living dentin. I am not so certain on that point. That is that the formation of cementum continues on the surface of the root from which pulp has been removed, and moreover, formation of cementum continues on fragments of diseased roots in which there is no living dentin. For instance, I saw a case a few days ago, in which a tooth which had lost almost all of its peridental membrane, had become turned over sideways and formation of new cementum along the new under surface had occurred. Any damage to the outer surface of the dentin is always repaired by the formation of a new layer of cementum.

No surgeon ever closes a wound; all he does is to control conditions so that the living tissues can close the wound, and the thing that has led to the development of modern surgery has been a knowledge of the conditions of life and an ability to control cell activity. The same way in this field. No dentist can ever reattach the tissues to the surface of the root, but if he knows enough about the vital conditions and can control them the tissues may be able to carry out their activities, and they may reattach themselves in their normal position.

Dr. G. V. I. Brown, Milwaukee, Wis.: The subject opens up vast possibilities in our treatment of pathologic conditions affecting the cementum and adjacent structures, which if these slides are as they seem, will make it possible to do a great deal more than has ever been attempted before. It is another example of the wonderful versatility that cells display in adapting themselves to adverse conditions which sometimes leads to the production of cells essentially different in their ultimate character from the condition of the original cell. It certainly is new to me to know that cementum would spread itself over a bare surface of dentin, whether living or dead, as this seems to have done. I would like to be a little more certain as to just how far the fibers of the pulp in that tooth had extended themselves, and have no doubt Dr. Fletcher will be able to tell us whether this would be the kind of thing which one could expect regularly from cementum under pathologic conditions, or whether it is merely the outgrowth of pericementum quite similar perhaps to that which we find where we have hypertrophic conditions and polypoid gum tissue, or if it is only an unusual case.

Dr. T. W. Brophy, Chicago: The essayist has brought two very important subjects for consideration; first, the importance of observing the correct nomenclature; and second, the wonderful reproductive powers of Nature. As to etiology, he has not entered into it. However, we have a local condition which is aggravated by lowered vitality of the patient. Anything which decreases the patient's vitality aggravates the disease in this locality the same as anywhere else. Therefore, proper treatment of patients from a systemic point of view should be considered. The work of Nature in depositing cement on this pericementum has been pointed out by the essayist in a manner that explains many of the conditions that we find associated with the teeth that have never been heretofore pointed out. If so, it has escaped my attention. What the essayist has presented here will be very interesting material for the men working along these lines of pathology and histology.

If the pathologic condition has advanced to a point that has left the tooth denuded of pericementum—if there has been considerable destruction of the surrounding bone—though the tooth may be an irritant to the tissues about, in such a case I think the tooth is gone. The essayist has not told us that Nature could reproduce the alveolar process. I have never heard anyone say that could be done. I do not believe it can be done. The greatest mistakes made in treating alveolitis have been in the failure to make diagnoses—to determine to what extent the parts are lost. If the only support of the tooth is gone, the tooth is lost, notwithstanding the fact that it may still be present and adherent to the membranes. It seems to me that where there is doubt, every practitioner should have a skiagraph made, in order to be of the greatest service to his patient.

Dr. Eugene S. Talbot, Chicago: This specimen certainly has brought out some beautiful things which will give us material for future study. As to the application of this condition to repair of the alveolar process, etc., I can hardly agree with Dr. Fletcher. There are two fixed conditions, foundation principles, we cannot get around; one, that the alveolar process is only a temporary structure to hold the teeth in place, and as the persons grow older, the process is absorbed; second, that the alveolar process is an endorgan. These two points must always be considered.

In the first place the patient must have been about 17 or 18 years of age. The chances are that such a condition would not be found in an individual who had obtained his growth. After the process has built itself around the tooth, it is simply waiting for an irritation to tear down the alveolar process. This is only a matter of time. If a man live long enough and keep his excretory organs in good condition, the alveolar process, without disease, will gradually absorb, and he will lose his teeth naturally. As I tried to show yesterday, and as Dr. Noyes brought out very beautifully in his pictures, when the matrix is destroyed—the lathing—the fibrous tissue within the alveolar process of the bone cannot possibly be restored under any circumstances. It is only partially restored in other bones of the body needed for the future support of the individual; so that his analogy, to my mind, will not hold good.

Dr. Frederick Noyes, Chicago: There are two points clearly shown in the microscopic specimens that are particularly important. The first is that the broken surface across the end of this root shows first an absorption in the dentin, and then the laying of the cementum on it. In other words, the tissues came into physiologic contact with that dentin, first to absorb it, and then the absorbing cells were replaced by building cells, and the tissue was attached to it. I believe this is important. Second, it is evident that the pulp chamber has been largely obliterated by the formation of dentin by the remains of living pulp in the broken root, and in a hurried examination it is impossible in all places to find the junction between the cementum and that secondarily formed dentin; but I think it is a little misleading to assume that all of that tissue down in the pulp chamber is cementum. It is not. It is at least largely secondary dentin, and the cementum has overlapped on to that at the mouth, but I think it does not cover it entirely, though I would not be positive. In the treatment of these conditions, I believe that the tissues will first lie in contact with that denuded root for the purpose of absorption, and then the absorbing cells will be replaced and forming cells produced. This is an exceedingly important factor.

Dr. William C. Fisher, New York: Does Dr. Fletcher mean to convey the idea from this specimen that he hopes to build by stimulation the cementum body, filling in such spaces as may have been produced by the waste product of alveolitis? And if so, to what point can this be controlled? In other words, is this a sort of artificial exostosis that he would stimulate?

Dr. M. H. Fletcher, Cincinnati: Dr. Noyes' description of what he saw in the specimens indicates the necessity of putting it properly before you. The only way this can be done is to have you study the specimens through the microscope. If Dr. Noyes had time to look through all the specimens, he would find a few that are perfect, where there is no breaking away of the cementum from the dentin in the process of mounting. The law of repair would make me believe, after all our scraping and polishing of roots, that Nature still puts the root surface in proper condition for reattachment of the bone.

In answer to Dr. Fisher, I think what the cementum does is to reproduce itself on the surface of the root, preparing a surface to which bone may be attached through the periosteum; to what extent I do not think we know. Theoretically, I should say it will cover any place on the root that is in normal contact with healthy periosteum, thus we can at least have what is left in a healthy condition.

In answering Dr. Talbot I would say that it is a well-known fact that an organ which is not continually and normally used is changed to a useful form or position or it disappears, but the alveolar process is constantly in use so long as the teeth are present. I have seen mouths of elderly persons in which there was comparatively no recession of the gums, except where disease from local irritants existed. I do not believe in the idea that the alveolar process is a temporary or transitory organ. It disappears if the teeth are removed, but it will remain so long as the teeth remain without local disease. The permanency of this bone is shown in animals where the teeth are of persistent growth. In the tusks of elephants, the incisors of rodents and all animals that have teeth of persistent growth, the alveolar process, the periosteum and the peridental membrane are in perfect health so long as life lasts. I have examined the mouths of many animals, and if I understand the doctor correctly, I do not agree with him that the alveolar process is transitory or weakened excepting by disease. If the gums and bone about the teeth are kept healthy I believe the alveolar process is as permanent as the turbinates or other thin bones connected with the air passages.

Regarding the cementum, it is a law of the construction and attachment of teeth of vertebrates that it exists on the root. I do not believe we as practitioners have attached the importance to this fact that it demands. Such men as John Hunter, Richard Owen and Purkinje are the ones who gave us the best knowledge we have of this tissue, but they were not dentists and could not realize the importance it is to us today in the treatment of the diseases of the tooth sockets. We should know more about this tissue and call it into use in our work from the present on. Nature utilizes cementum between plates of enamel for constructing perfect grinders in many animals. The cementum wearing away faster than enamel leaves indentations which form perfect mill stones for grinding the rough foods which would not otherwise be digestible.

CALCULUS IN STENO'S DUCT*

By Dr. A. C. Runyan, South Haven, Mich.

IN presenting to you the history of this very interesting case that recently came under my observation and treatment, I want to call your particular attention to its rarity, the small amount of literature pertaining to it, and the difficulties I encountered in arriving at the proper diagnosis.

Case—A young man, about thirty years of age, with a large swelling in the region of the right parotid gland was sent to me by one of the local physicians. His general health was good and on examination I found that the swelling had no connection with the teeth. On obtaining the history I found that for some time, when eating, the gland would become swollen, and at times was quite painful. But the swelling and pain would usually subside in a few hours and might not recur for several days.

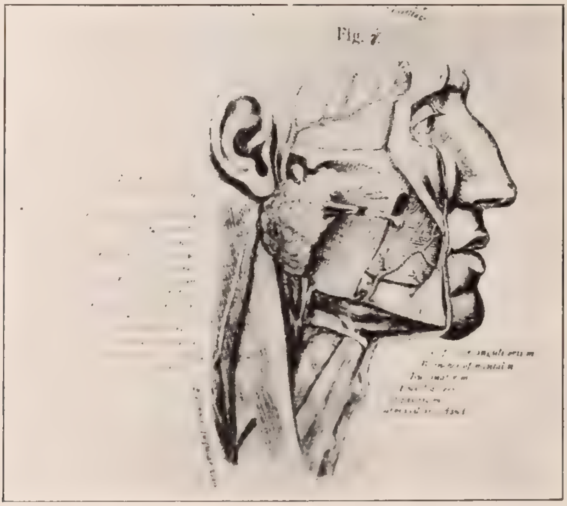
Fig. 1.

Before being sent to me he had consulted two doctors without getting any satisfaction, explanation or benefit from their treatment. From the history of the case I decided that there must be some stricture or stoppage in Steno's duct, and, on manipulation and massage along the tract of the duct, I forced through the opening a clot of thick mucus. After a little more massage the swelling entirely disappeared and did not recur for several days, when I again removed a clot of mucus, which was followed by a granular substance, that I thought might be particles of calculus. I put some of it on a slide and had it examined by a microscopist, who found it to be pus.

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*Read before the Kalamazoo Valley Dental Society, 1910.

I had intended to pass a sound through the duct, but on the discovery of the pus I hesitated to do so for fear of infecting the gland. I therefore decided to take the case to Ann Arbor, and made arrangements with Dr. Darling. He went into the case thoroughly, and we decided to pass a sound. We did this after considerable difficulty.

In passing the sound I thought I detected a calculus, but Dr. Darling could not find it when I would pass the instrument to him. So the doctor decided to have an X-ray taken, and I left the patient there. He remained several days and the X-ray did not show any obstructions. Then Dr. Darling returned the young man to me with instructions to pass sounds to enlarge the duct and to keep the tract thoroughly syringed with antiseptic solutions. I followed these instructions for several months, but as soon as we would quit passing the sound for a few days the mucus would form and then cause an obstruction. On one occasion when the patient had to be away for several days on business, he returned with a badly swollen face, quite inflamed, and on evacuating the duct there was quite a quantity of pus.

In the meantime, in passing the sound both the patient and myself thought there were times when we could detect a calculus; and, as we seemed to be getting no nearer a cure he was anxious to go for further advice. We decided to go to Chicago to Dr. Gilmer, of the Northwestern University. Dr. Gilmer gave us a hearing as to the history of the case and I told him of my belief that there was a calculus in the duct, but he was unable to detect it, and he was very thorough in his examination.

Dr. Gilmer placed a cambric needle in a broach holder and punctured the whole length of the duct without meeting any obstruction. Furthermore, he stated that he had put in the most of his time for the past year on the study of the parotid gland and that it was claimed that a calculus never formed in Steno's duct. He recommended the carrying out of practically the same treatment as Dr. Darling, which we followed for some time with no definite results.

In the meantime, the young man consulted one or two other specialists, without results. And if we neglected to pass the sound for any length of time the swelling would recur. He, therefore, was becoming very much discouraged, having been under treatment, more or less, for over a year and was apparently getting no benefit.

I told him I was sure that there was a calculus in the duct and if he would submit to an operation we could satisfy ourselves at least. This he consented to. I called in one of our local physicians, and, after thoroughly using cocain around the point where I thought I located the calculus, I made an incision directly on to it. The doctor and I both could feel something hard and we both worked for nearly an hour trying to dislodge it. Those of you who have ever tried to remove an encysted shot can appreciate our trouble. We finally lost it entirely, and I made up my mind that I was mistaken, that the other doctors were right, and that there was no calculus there.

I had made a large opening and the next thing was to have that closed without destroying the duct. I arranged to see the patient twice a day to pass the sound to keep the duct free while the wound was healing, as there had been some pus in the duct and when I operated there was some infection and quite an inflammation.

The second day on passing the sound I again detected the calculus. I then took a large spoon-shaped excavator, which I used as a curette, and went into the opening, and with very little difficulty removed a disc-shaped calculus about the size of a small pea. It was located about three-fourths of an inch back from the opening of the duct and I cannot account for its being there. Neither can I explain the difficulty of its location.

I continued the passing of the sound until the wound was entirely healed. It has now been over seven months since the operation and both the gland and the duct seem to be in a perfectly normal condition.

I wrote both Dr. Darling and Dr. Gilmer of the success of the operation. They each wrote me congratulating letters and requested me to write the case up thoroughly, as there was so little literature on the subject. Consequently, I am giving this here today so that it may appear through its proper channel.

SECTIONAL BRIDGE FOR SLANTING OR CONVERGED ABUTMENTS*

By Delos H. Carpenter, D. D. S., Minneapolis, Minn.

In making a replacement where the teeth have been missing for some time, especially in the lower jaw, we find the abutments have attained a very slanting or converged position. To make a bridge for this condition in one piece, it would be impossible to adjust.

To overcome this difficulty the method here described has proven to me very satisfactory, and has a great many advantages, I think, over anything I have ever seen or used.

The case here presented (See Fig. 1) is a duplicate of the original one in which the method was worked out, with the exception of the molar being cut down, and does not show as marked a condition as in the original model. However, this method does not complicate the construction, no matter to what extent the change in the abutments have taken place.

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*Given as a table clinic before the Minneapolis Dental Society, Minnesota and North Dakota State Dental Associations, 1910.

METHOD OF CONSTRUCTION

Having prepared the abutments (regardless of their position) as for any other bridge, flow wax on the inner side of crowns before pouring, so they may be removed from time to time as the work progresses.

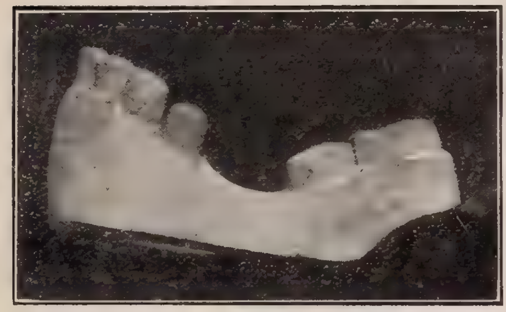

Fig. 1.

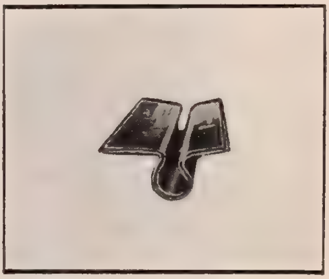

Fig. 2.

Now take a piece of 32 gold plate the width desired and bend it double, keeping the edges together. With a pair of small round nose pliers bend the desired shape. (Fig. 2.)

In this case I have made a cone shape. For a removable bridge or where you wish to attach to a porcelain facing, I make it more of a dove-tail shape. However, this can be made to suit the case. It is only necessary to bend the pieces together, as the accuracy of the joint depends on this very important point.

Trim down the edges to width you want your cusps. Now slide out the inner piece and with inlay wax wax up the outer piece and cast. (Fig. 3.)

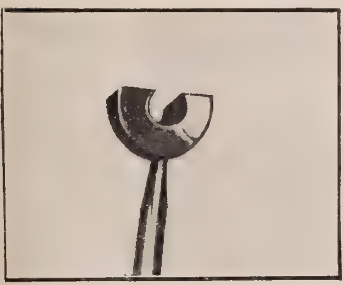

Fig. 3.

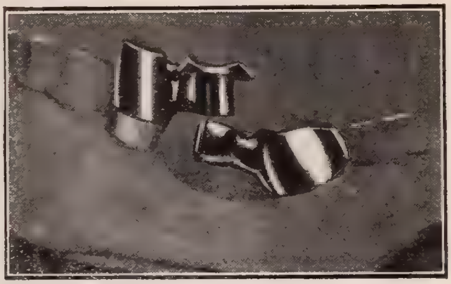

Fig. 4.

Fig. 4 shows both sections completed, one being raised ready to drop into place.

Solder this to either one of the abutments (preferably the one with the greater slant) so the groove will correspond with the position of the other.

Now trim the top of this section as flat and smooth as possible and wax up the other piece with sufficient wax for cusps, place in position, and bring down articulator for bite. Carve this while in position, and slide it out, cast and solder this to the other abutment.

In placing this in position, I prefer to cement both pieces, also the joint at the same time.

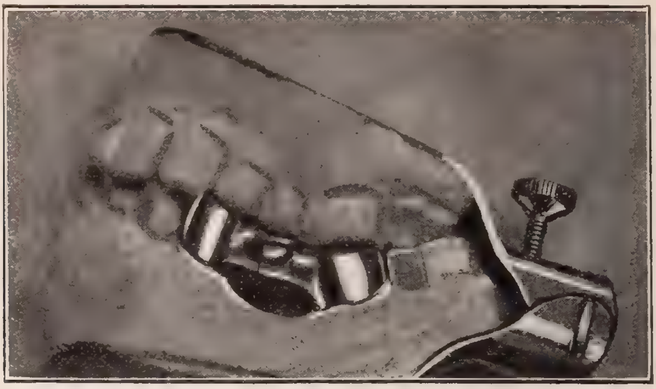

Fig. 5.

Fig. 5 shows both sections in place.

It has been suggested that I put a pin in the joint. I see no necessity in doing this, although it is a very simple matter by drilling a hole and putting in a graphite point, replacing with a gold pin.

In this method you will find that pressure at any point of contact will not separate the joint. There are no weak or delicate parts, and when placed, makes something strong, practical and sanitary.

NUTRITION AND ITS EFFECT ON THE DEVELOPMENT OF TEETH*

By R. J. Seymour, M. S., M. D., Columbus, Ohio

ONE OF the most fascinating themes for writers in physiology and medicine is that of infant feeding. Especially is this true in recent years since chemical analysis has become part of the routine of the modern physician's activities. Yet despite the fact that almost every issue of any scientific journal offers its contribution on infant feeding it is difficult to find any two that agree in all details, apparently because there is as yet no set rule for the diet of the infant. Since no two persons of mature age will give the same results as to energy or gain in body weight on exactly the same diet, it is much more certain that the child, lacking the adaptability of the adult both as to diet and to external conditions, will follow less exactly the laws of theory that the physiologist may formulate. There are, however, certain fundamental facts that are worthy of mention in connection with infant feeding.

In considering the effect of nutrition on the development of the tooth it will prove profitable to review briefly the method of tooth formation as well as the structure and chemical composition of the adult tooth. The first indication of the tooth is found about the seventh week of intrauterine life when the basal row of cells covering the gums invaginates to form the dental ridge (groove). Figs. 1 and 2. From this buds are given off, each bud representing the primordium of one of the temporary teeth. At the sixteenth week the permanent tooth bud may be found as a secondary bud or outgrowth from the first (Figs. 4, 5 and 6).

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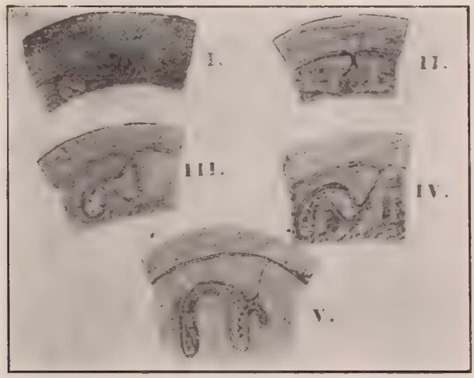
*Read before the Columbus Dental Society, 1910.

Meanwhile the temporary bud has developed into a sac, which, through a second invagination by the fibrous tissues just beneath the epithelium, has become two-layered, thus forming the inner and outer enamel cells. (Figs. 5 and 6). Just beneath the inner row there is a differentiation of the outermost cells of the fibrous tissue (tunica propria) to form a fairly even row of elongated cells, the odontoblasts. (Figs. 6 and 7). The outer row of enamel cells gradually atrophy (Fig. 6), and do not functionate in the formation of the tooth proper. The inner enamel cells lay down enamel on their inner surface, while the odontoblasts secrete dentine on their outer surface. (Figs. 7 and 8.) At the time of birth there may be found well formed layers of both enamel and dentine although the tooth is still imbedded within the gum.



Figures 1 to 5.

Chemically dentine closely resembles bone, containing about 25% organic matter and 75% salts. Enamel contains still more salts, having only 2% organic matter. The salts are chiefly calcium phosphate and calcium carbonate with traces of magnesium phosphate and calcium fluoride. With this analysis in mind the importance of salts in the development of the tooth becomes apparent.

Nutrition is a broad term, including not only diet, but digestion and absorption as well, and it frequently happens that the digestibility of a diet is more important than its showing of sugars, fats, proteids, etc., in a table of chemical analysis. So in studying the effect of nutrition on tooth development these factors must be borne constantly in mind.

The effect of a poor, sometimes pernicious, diet is striking in the adult. In the child the result is seldom short of calamitous. There is, among the laity (and too often in the profession), widespread ignorance of dietary law and even hygienic rules. Poverty and its attendant evils will quite naturally be a factor predisposing toward an unsuitable diet yet it does not always follow that paucity of food results in disturbed nutrition. In fact, the danger frequently lies in just the opposite direction.

Not long since a mother brought her five months' old child into a physician's office for treatment. Pinched, colorless features, scrawny limbs, sunken eyes, nervous, fretful and crying, the babe presented all the symptoms of faulty nutrition. On being asked what food the child was being given the mother exclaimed with pride that she was very careful what she gave the baby, allowing it "only a half cup of coffee at a meal." It is not always lack of food that causes the trouble.

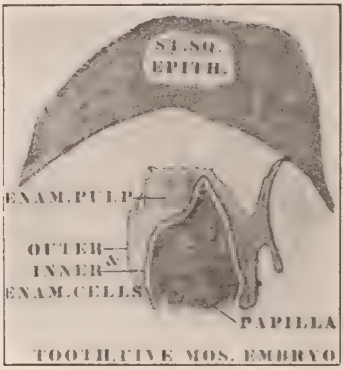


Figure 6.

As the first steps in tooth formation occur during fœtal life, the diet of the mother has some bearing on the future teeth of the child. Happily, as a general rule, prospective mothers give an added care to their diet and to personal hygiene; it is only necessary that such care be taken. Common sense rules as to diet, exercise, etc., will suffice since the general physical condition of the mother is the only pre-natal influence that can aid or harm the child.

After the birth of the child, mother's milk is the diet par excellence for the babe. There is nothing else that quite takes its place. Unfortunately it is not rare that it is impossible for the child to have the mother's milk and other milk is used as a substitute. That most commonly used is the milk of the cow or goat. The proteid of such milk is coagulated in lumpy masses which remain for a long time in the stomach. Such a condition is suitable for the young of those animals since in ruminants the major part of the digestion is to take place in the stomach.

Mare's milk, which is sometimes used, contains a proteid that coagulates in jelly-like masses that leave the stomach in a short time. Human milk stands just between the two, the proteid coagulating in flocculent curds that remain in the stomach a sufficient length of time to be partially digested before passing into the small intestine.

In a recent number of one of the leading medical journals were two long and well written articles on infant feeding. The authors gave in some detail the composition of milk, its per cent. of fats, of proteids, of carbohydrates, the proper methods of testing and of modifying—but not a word concerning the importance of salts to the child. Any physiology will tell one that these inorganic substances build the rigid tissues, stimulate secretion, keep organic (proteid) substances in solution, are necessary to the heart beat, etc. Surely such an array is sufficient to make the salts found in a diet worthy of study. Furthermore, it is well known that the cells of the body are unable to manufacture these salts from other constituents of a diet. Neither can one salt be transformed into another. The salts must be taken in the form in which they are to be used in order to be available.

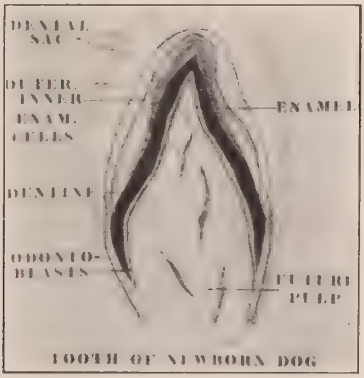


Figure 7.

The average amount of salts found in human milk is about three-tenths of one per cent. while that of the cow, goat, and mare contains a little more than twice as much. Naturally the human organism requires a great variety of salts and according to Soldner the following table represents the proportionate amounts of the several salts found in one hundred parts of the mineral matters of milk:—

Sodium chloride	10.62	Di-calcium phosphate	7.42
Potassium chloride	9.16	Tri-calcium phosphate	8.90
Mono-potassium phosphate	12.77	Calcium citrate	23.55
Di-potassium phosphate	9.22	Lime, combined with proteids	5.13
Potassium citrate	5.47		
Di-magnesium phosphate	3.71	Total	100.00
Magnesium citrate	4.05		

Dentists and physicians frequently prescribe lime water for the child whose teething is delayed. At best this will supply only calcium salts, some carbonate, perhaps a little chloride. But the tooth, as will be remembered, is mostly calcium phosphate and salts of magnesium. Lime water, therefore, can not give to the organism the salts needed for tooth development.

Lack of salts, or rather lack of a variety of salts, is now well known to be the cause of both rickets and scurvy. Sir William Jenner, DaCosta, and other noted authorities agree that rickets, in other words, lack of salts, causes delayed teething and furthermore that the teeth decay soon after eruption.

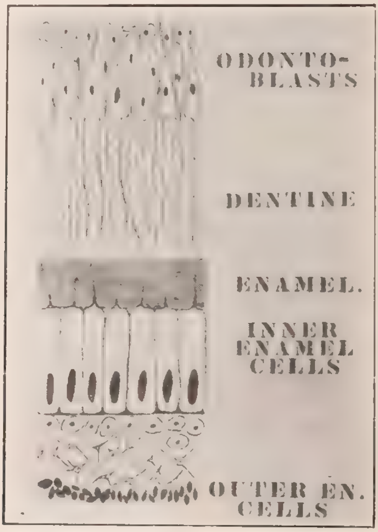


Fig. 8.

(Highly magnified, semi-diagramatic, portion of tooth shown in Fig. 7.)

It is such conditions as these that the practicing dentist is often asked to alleviate. A child of 18 months is brought to him because no teeth have appeared. Another of three years is losing its teeth shortly after they erupt. The majority of such cases will present some of the classical symptoms of rickets. Beaded ribs, sensitive skeleton, slight fever, restlessness, bow-legs, swelling of the cartilage near the head of the bones, "square box" head, "chicken breast" all these things indicate rickets.

Happily the prognosis is good. Change of diet is, of course, the chief factor, including hygienic care. Foods rich in salts are indicated. Medicines are usually not needed, but small doses of calcium hypophosphite, calcium lacto-phosphate, the citrate or malate of iron may be given. But better than all these for the rickety child are the fresh fruits and vegetables which are the chief sources of salts in a diet. Not only are the fruits more pleasing to the child than medicines, but they have the added advantage of offering a far greater variety of soluble salts than is possible through ordinary medication.*

For the younger child, the fruit juices may be used. A teaspoonful of orange juice three times a day will often cause a marked improvement in the general body nutrition. Lemon juice in water, a little scraped apple, wheat or barley broth, properly prepared meat juice—all these may be used as pleasing changes and additions to the diet of the young child. All will serve the same purpose of increasing the salt content of the diet.

The question has been raised by several dental surgeons whether the constant use of fruits, particularly the more acid ones, would not have a deleterious effect on the teeth. The investigations of W. D. Miller and Leon Williams show that "it is highly improbable that the enamel is affected, except in rare and special cases, by any other acid than that which is being secreted by the bacteria at the very point at which they are attached to the enamel." Dr. Miller has proven by his investigations, which have been substantiated by Dr. G. V. Black, that enamel may be destroyed by acid which is concentrated upon it for a time. But both workers agree that "the only way to concentrate acid upon enamel is by the lactic acid method, namely in a glutinous-like mass with the bacteria excreting directly upon the exposed surface; free acid from other sources is not and probably can not be covered into or contained within these masses."

The danger of injury to the enamel, in the light of these researches, would seem to be extremely small, especially with the weak acids and acid salts that are contained in fruits.

Frequently the cause of disturbed metabolism may be traced to the habit of sterilizing milk for the use of the infant. Both sterilization and pasteurization render many of the salts found in milk insoluble and thus render them incapable of performing their usual functions. It will also frequently happen that the use of liquid foods by the child is too long continued. The digestive organs of the one year old child are capable of digesting some of the solid foods and some such food should be given, restricting the starchy foods at first.

It has been suggested that the use of any unusual amount of fruits by the child would tend toward the production of calculi. This will not prove to be the case. Calculus formation is due to various obscure pathological conditions and not merely to an abundance of salts. DaCosta even attributes the formation of calculi partly to "constipation and depression of spirits."

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*The analysis of the apple serves to show the great variety of salts to be found in fresh fruits. The analysis shows that the apple contains chlorides, sulphates, phosphates, carbonates and malates of potassium, sodium, calcium, iron, magnesium and silicon. The analyses of other fruits show a similar large variety of salts.

It is certainly true that the use of fresh fruits or their juices will not be accompanied by any disturbances of nutrition and undoubtedly in many cases such an addition to the diet will give results that are little short of remarkable.

A COMPARISON OF OLD AND NEW STYLE ATTACHMENTS IN FIXED BRIDGES*

By R. B. Howell, D. D. S., Ann Arbor, Mich.

It is fortunate that in the selection of a subject along any practical line there is never a dearth of problems to discuss; with us the problem is never what can but what shall one write about. Any line of work which depends entirely upon the creative and manipulative ability of the operator is certain to present some opportunities for a difference of opinion. So the task of the writer in preparing a paper on this subject for this occasion is an easy one. In fact, there are so many phases of the subject he would like to have discussed that he experienced difficulty in making a choice.

It is probably believed by all of us, that the prevalent methods in the application of the principles in bridge work by our profession are entirely too transcendental. Man is such a creature of habit, that in this, as in other things, he is too prone to adhere to those methods which were early taught and then impressed upon him as infallible. Of course they may be in many cases, but when misapplied through lack of proper consideration they may also become most fallacious. No empirical method can be followed. The tube and split post is not always the best attachment for removable bridges, nor is the band and dowel the *sin qua non* in attachments for fixed bridges, any more than the old solid rubber tire of a bicycle would be adaptable to an automobile.

The purpose of this paper therefore is to bring out more thought and display of intelligence in the application of the principles which govern attachments in fixed bridges. The subject chosen is simply one of many which could be considered for this purpose and it is hoped will bring out a liberal discussion.

It is not necessary to discuss in detail the *importance* of the correct preparation of abutments and perfect construction of the attachments to assure success in bridge work; suffice it to say that just as "no chain is stronger than its weakest link" so no bridge is stronger than its weakest attachment or dummy. And as the perfect construction of a foundation is most necessary to the permanency of an edifice, so the correct preparation of the abutments and restoration thereon of the best attachments possible, both in principle and mechanical structure, is the thing to be absolutely obtained to insure the desired stability and longevity of the bridge.

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*Read before the Michigan Second District Dental Society.

In order to approach this subject in a somewhat systematic manner, let it be taken for granted that a case for bridge work is presented. Now what is the duty of an up-to-date practitioner of Dental Prosthesis, what is there for his consideration? In the first place he should keep in mind what his branch of the profession suggests, that he is by an artificial method endeavoring to restore a lost function; and, it may be added, one of the most important functions in the human body, as mastication is the first step in the process of body nutrition. The proper preparation of food for deglutition depends then upon the restoration in that mouth of a masticatory apparatus as ideal and natural for that mouth as is possible. The completed structures should in no way interfere with the normal physiological condition found in that mouth; there should be nothing irritating to the soft tissues and the physiological individuality of each tooth used as an abutment should be retained if possible, in fact, both of these conditions may sometimes be improved upon. It should be perfect in mechanical structure (both attachments and dummies), strong enough to withstand all force of mastication, of a material thoroughly compatible with its environments; it should be ideal from the anatomical aspect,—perfect occlusion and alignment, the exact form should be restored, and last it should be natural in appearance, in other words hide its artificiality.

The place of attachments in this ideal structure can easily be seen and it can be stated very positively that the success or failure of this structure will depend upon them.

In the discussion of the requirements for attachments it can best be considered under these four heads: 1, Physiological. 2, Mechanical. 3, Anatomical. 4, Esthetic.

As to the Physiological requirements, the first thing to do in the treatment of the case is, by a series of thorough prophylactic treatments to put the mouth in a normal, healthy condition. Almost 90 times out of a 100 cases for bridge work require this treatment, simply because most of the teeth have not been performing their function and just as atrophy always follows lack of use, so the soft tissues have become diseased. After this has been accomplished the next step is to obtain good plaster impressions and pour models from the same and then mount the models upon an articulator which at least *endeavors* to imitate the migrations of the mandible, so that the articulating movements can be ascertained. From these models a diagnosis, so to speak, can be made and the means of attachment decided upon, this decision being covered by all the principles applicable to the same.

The next physiological consideration is that of devitalization. This one has caused enough discussion to fill volumes. Some have argued that "the tooth should *always* be devitalized when used as an abutment" and others have said that "the *nerve* should *never* be destroyed." The arguments are too well known to be repeated here, but they deserve some recognition. To the mind of the writer, however, this question is one of minor importance and deserves very little consideration when compared with other facts. In the posterior part of the mouth the mechanical and anatomical principles are those which demand chief attention. If the vitality of the tooth in any way interferes with the proper application of these principles it should most certainly be destroyed; if not, there is no reason why it should not be retained. In the anterior part of the mouth the esthetic, mechanical and anatomical principles are of chief importance and, just as in the posterior part, if these are in any way impaired, destroy, and if not retain the vitality of the tooth.

Taking up the remaining requirements, the mechanical, anatomical and esthetic, this paper will consider them together, as applied in the posterior and anterior part of the mouth.

The mechanical ranks first in importance in the posterior and probably second in the anterior part of the mouth. In the posterior region there is a tooth which has one of the strongest physiological attachments to the jaw and from its situation the operator is enabled to construct an attachment which can be made without a great sacrifice of tooth substance for the sake of appearances. The telescopic crown has been considered as being nearer a universal method for such location than any other and deservedly so, because not only can it be made to possess inherent strength, but the abutment itself can be left more nearly in its normal condition than by any other principle.

The first that particularly attracts our attention in this connection is the preparation of the abutment and not for the crown alone, but, as the anterior abutment is usually one which is not so easily formed, it is necessary that these posterior abutments should assume most of the burden of parallelism between the two.

What is the correct preparation for a telescopic crown? In the first place only as much tooth substance should be taken from the top of the tooth as will be necessary for a strong occlusal surface to crown. Then the walls should be ground down so as to make the greater circumference just beneath the gum line, then it may be necessary to grind more for establishing the parallel lines, as before mentioned. This is all that should influence the operator; true it is nearly always necessary to remove the enamel, but this is not expedient in all cases; not always in the lymphatic type, more frequently in the sanguine and still more in the bilious and nervous. Too much stress cannot be laid upon the technic in the preparation of the abutment for a telescopic crown. The operator should never forget that he is working upon extremely sensitive tissue; the fifth nerve is by far the most susceptible of all cranial nerves; there is a limit to its irritability therefore be as expeditious and careful as possible. In using stones for grinding revolve away from the tooth so as to push the gum back rather than the hammering of it against the tooth as you do by the reverse; cross cut enamel burs work faster in some locations; small stones mounted on mandrels for the contra or right angle have their place: excising forceps can also be used quite frequently. Although each operator has his own method which he can use best, still the above suggestions should always be followed.

Taking up the consideration of the telescopic crown the anatomical requirement will be considered with the mechanical, the esthetic is of no consequence in this location. There have been two methods of construction up until a recent time. (1) Sectional (natural bite preferred) and (2) Seamless; but lately has been added the cast method which will be considered in another place in this paper. The essential requirements of a completed crown are much the same as that given for bridges: It should be made of sufficiently high karat to withstand any chemical action which might take place in the mouth; and of a gauge necessary to stand any stress put upon it; it should be a perfect fit to the abutment, passing a uniform distance beneath the gum line without irritation; it should restore the point of contact with approximating tooth it presents and be contoured to typical shape; it should have perfect occlusion, with cusps prominent enough to aid in the act of mastication but not so much as to interfere with the movements of the mandible. It should be in perfect alignment; and, last and most important, when placed on the abutment, it should receive the stress of mastication in such direction as to assist rather than be a menace to the integrity of the entire structure.

In taking up the anterior part of the mouth, as has been stated, it is the opinion of the writer that the esthetic is the important consideration, with the anatomical second and the mechanical third. This means, then, that the strength of attachment should be sacrificed for the sake of appearance; it does not mean, however, that the stability should be entirely overlooked.

Anterior attachments may be classified as (1) those to roots as band and dowel and (2) as those to the natural crown of tooth. In the latter the endeavor is made to obtain adequate support with the conservation of as much tooth as possible. Of the dowel crowns there are the band and dowel, the plate and dowel.

The advantages claimed for the first over the second are: (1) Better sealing of the root, (2) Protection of the root against fracture, (3) Stronger attachment for bridges. The advantages of the plate crown over the band are: (1) More natural restoration possible. (2) The securing of normal condition of the gingiva. (3) Preservation of the continuity of the root. It is the opinion of the writer that the band and dowel is used much more frequently than indicated. The deleterious effects produced by irritation from the band alone are of more consequence than the extra strength of attachment gained, in the great majority of cases.

In the technic of root preparation here again extreme care should be exercised; save the patient as much as possible. In the preparation for the band it is absolutely necessary to obtain correct form; there should be no undercuts at any point around the circumference of the root and this necessitates the removal of the enamel in nearly all cases. It should extend slightly beneath the gum line on the labial and leave as much as possible on the lingual so as not to interfere with the facing.

In the preparation for the plate crown, the saddle effect is the best form and that following cervical curve second.

Taking up the mechanical structure of the band and dowel it is the opinion of the writer that the band should be always made of iridio platinum of 34 or 36 gauge, and the top of the cap with platinum of the same gauge. The band should have a long lap and all soldering be done with pure gold and heated until the alloy is formed, to prevent future unsoldering. In this manner a band is made which will not stretch, and if properly adapted will not allow any movement independent of the root and not afford much chance for irritation.

For the plate crown if the root is irregular, thin platinum should be used, about 36 gauge. In regular, with straight slants, platinum of 32 gauge is better. The iridio platinum dowel is the most desirable and should be made round and tapering. The prevention of the rotation of the crown on the root should not depend upon the shape of the dowel.

In the selection and adaptation of the facing remember that the esthetic is of the first importance; so do everything possible to make the tooth simulate nature; remember the natural curve at the cervical, let it follow the gingival line; keep the tooth in alignment both at neck and at the incisal edge; select the correct color and keep in mind the shading produced by different backings. It is the opinion of the writer that it is better to leave the incisal edge free rather than grind a bevel for a gold tip, this again on account of the esthetic effect.

It is the purpose of this paper to compare the ideal attachments of the old form to those which have been made possible through the principle of casting and which might, for the advantage in discussion, be termed "new form." The discussion which has gone before is, in a brief manner, a statement of the requirements of the old form attachments. A careful examination of the latter shows that, although ideally conceived and perfectly executed, still they are far from being the thing sought. The telescopic crown will always require the destruction of the periphery of the abutment at the gingival line and there will always be a certain amount of irritation of soft tissues due to the presence of the gold band. The band and dowel, although probably the strongest of all crown anterior attachments, yet has its disadvantages, namely, irritation from band and difficulty in restoring the natural cervical contour. The plate and dowel crown, although it can be made more nearly perfect from the esthetic standpoint, yet lacks strength, owing to the shortness of the dowel and lack of concomitant means of attachment.

It can readily be seen then that any step towards the preservation of the tooth in its natural contour of crown is one in the right direction, as has been inferred, no matter how much an artist the operator may be, he can never exactly restore the natural position: our own teeth in normal position and form are the best, so any attachment which tends to minimize the loss of tooth structure is a decidedly progressive act. Unfortunately the lack of ability and misconceived ideas have greatly prevented our advancement in this direction.

The development of the casting principle has, by the adaptation of the so-called "partial crown attachments" at last put into our hands the means to make a strong attachment and still retain the continuity of the natural tooth so desirable. In order to be perfectly understood a "partial crown attachment" is one which never encircles the tooth on the labial or buccal side by band but security of position is obtained by different mechanical means to the lingual or linguo-occlusal surfaces. These, in the past have never been considered a very strong abutment-piece, but have been used as an anterior support to a more firm posterior. They have also been considered a more or less temporary procedure when compared with the well constructed full crown. Their successful application depends upon selective judgment, care in the preparation of the abutment, and accuracy of construction, and, if these are carefully carried out, to the mind of the writer there is nothing better for attachments in locations which will be enumerated later. Even if considered only a *temporary procedure* it is warranted in many cases from the esthetic requirement alone.

If one will consider the attachments which have been and of course are still in use (which this paper has classed as old style attachments) the conservation of tooth structure has been deemed desirable and has in many ways been sought for. The open face crown is a monumental example. The only reason it gained such a place in our principles was because it could be used on a vital tooth and that more of the normal continuity of tooth structure could be retained. This attachment has probably been more discussed, and might be added *cussed*, than any other, and not without cause, for it is probably the reason of more failures in bridge work than any other one method. To the mind of the writer, however, this was due more to misapplication and lack of care in construction than mistake in principle.

They should never be used on any superior teeth except the cuspids; and on the cuspids and laterals of the inferior; in rare cases where vital teeth are desired it still has its use in these locations.

The writer wishes to present several locations where it is possible to retain the anatomical conformity of the tooth to a great extent and yet construct upon them both permanent and sufficiently strong attachments for any kind of bridge. This can be done by the "Inlay and Dowel," "Carmichael" and "Partial Telescopic." The development in the process of casting has made this both ideal and possible.

The Inlay and Dowel is a modification of the old "plate and pin" so-called. It is particularly adaptable on superior cuspids; it can also be used on superior laterals and inferior cuspids and bicuspids. The advantages in principle obtained in this abutment piece are strength of attachment through the long dowel and distribution of stress through a greater amount of tooth substance. The inlay itself should not be considered as giving any extra strength; it merely acts as a means of uniting the dummy to the attachment, although some slight assistance may be given by the correct preparation of the abutment, particularly on the lower bicuspids.

The construction is as follows: Take the tooth where it has its greatest use, perhaps as an example, superior cuspid. This tooth should be devitalized, the canal filled and the tooth ground to the correct form, which is as follows: The lingual surface should be ground to a sufficient depth to allow from 1-16 to ⅛ of an inch of depth to the inlay and yet accommodate the articulation. Grind to good definite edges allowing it to extend slightly over the mesial and distal surfaces to form saddle effect is possible, and carry the side to be soldered to the dummy to a point which will allow the protection of the cervical border of the inlay during the soldering process. A good thick incisal edge should be left intact. The canal is then reamed out to accommodate the dowel, which should be of iridio-platinum of 12 to 14 gauge, round, tapering to the end. The top portion can be flattened out, split or roughened to form good adhesion to the gold when cast around it, or better still, the writer prefers to band it to a definite angle toward the attachment to dummy, allowing it to extend through the wax matrix as formed, also being careful to keep the bent portion of dowel free from the borders of the inlay as formed in the wax. The portion of the canal near the surface is then enlarged to allow the inlay wax to surround the head of the dowel and extend slightly down the latter. The inlay wax is then forced into place; in case of the lower bicuspid, the Ivory matrix is of greatest assistance here, keeping good definite edges. The dowel is then heated and forced down into the canal through the wax, cooled and trimmed to shape, invested and cast.

After casting it can be fitted to the tooth, ground to articulation and it is ready for the bridge. This makes a very strong anterior attachment with the least amount in loss of tooth structure. The abutment is also stronger as the stress of mastication is spread over a greater length of tooth and there is nothing to interfere with the normal relation at the gingival attachment. The connection with the dummy can also be made at the point of contact, thus restoring the interproximal space.

The Carmichael principle is familiar to all. It is particularly suggested on superior bicuspids. The advantage of the cast method is in the ease of construction and accuracy of the fit obtained. It is possible also to restore the full contour. The best preparation of the tooth is to first cut away the lingual cusp, then taper this portion, making a definite edge just below the point of contact; then the three grooves, one on the mesial, another on the distal and a third on the occlusal formed for retention. This can be done with small stones and cross cut fissure burs. It should be so shaped that wax will easily draw from the same. If greater strength of attachment is necessary, the tooth can be devitalized, the canals filled and a dowel adapted. The wax model is obtained by taking the impression over the tooth as prepared alone, or with the dowel, invested and cast; then fitted to the tooth when it is ready for the bridge. One is greatly assisted in the taking of the wax impression here by the use of the before mentioned Ivory matrix. Drawing it around the tooth and pulling together on the buccal side.

Taking up the last, the cast "partial telescopic" as it might be termed, the writer believes it has a great future. In this the telescopic principle is retained and, in short, all the advantages of the shell crown are retained but *none* of its disadvantages. It may also be made in some cases without devitalization of the tooth.

The preparation of the abutment is as follows: The occlusal surface of the tooth should be ground off to allow for the restoration of the same in the crown. This remaining portion should then be tapered to a well defined edge in the tooth's substance on the mesial, distal, buccal and lingual, being slightly below the point of contact on the two former surfaces and as low on the two latter as is necessary to strengthen the attachment. After smoothing up it is then ready for the crown. Now construct the band of pure gold of 30 gauge by sweating together, fit to the tooth, allowing it to project slightly above so there will be a surface to which the wax can adhere. The inlay is then put in place, having the tooth slightly oiled, the band dry and warm and the bite then taken. This is then taken from the tooth, carved up and prepared for casting, then invested and cast and finally fitted to the tooth when it is ready for the bridge.

This can be done in middle aged or elderly people quite frequently without devitalization of the tooth. The writer prefers, however, where devitalization is necessary, to use a dowel in conjunction with the crown, extending it into the lingual canal of the upper molars and distal of the lower, thereby gaining extra strength of attachment and stability to the crown.

This paper has not entered into a discussion of inlays as a means of attachment, as the writer deems them far inferior to these mentioned here. He does not consider them of any value whatever except as a seat for an occlusal rest.

SIMPLICITY and greatness go hand in hand. Pomposity, merely the affectation of greatness, deceives nobody, but the effort to keep it up weakens and finally destroys whatever of character there may be.

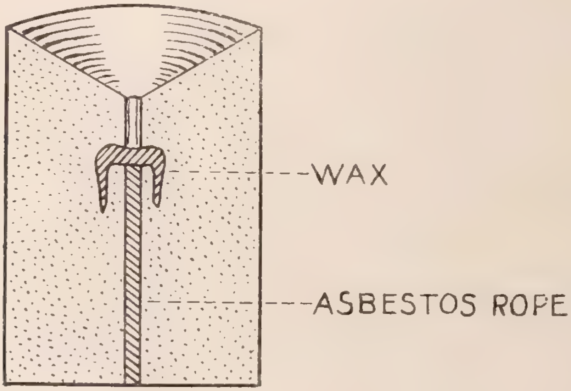
AIR VENTS IN CAST WORK*

By D. D. Smith, D. D. S., Sandusky, Ohio

The first question asked when the cast inlay came into use was, "In making the cast, where does the air get out?"

We know that the air does not always get out.

My object is to show a few ways to overcome this trouble. Some have been using a sprue wire from the base of the investment and not allowing it to come in direct contact with the impression, but withdrawing it a little. In these cases the gold is apt to blow or suck through and thereby make a failure.



If a little asbestos rope (about the size of an engine drill) be dipped into hot paraffin and allowed to cool, it will be of great service in forming air vents in cast work. Pour up as usual and while the investment is still soft insert the asbestos rope. The wax will make the asbestos easier to handle and burns out when heated, leaving a porous passage for the escapement of air and gases.

The asbestos may come in direct contact with the inlay wax.

PHYSICAL CULTURE FOR DENTISTS

By G. E. Harter, Toledo, Ohio

(Continued from page 89 Feb. Summary.)

Before dismissing the subject of deep breathing, which, by the way, is the most important phase of every system of physical culture, the attention of every reader is asked to the three diagrams printed herewith, illustrating sets of motions that should be practiced in connection with the breathing exercises recommended in previous papers. These movements combine the respiratory and muscular, and each acts as an aid to the other.

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*Given as a clinic at Northern Ohio Dental Society, 1910.

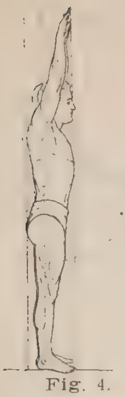

Fig. 4.

Assume the correct standing position as shown in Fig. 3. Be sure that it is the correct position; exercise taken in an incorrect position is worse than none, for the reason that exercise develops, strengthens and hardens muscles in whatever position they may be while the exercises are taken.

Place the hands together in front of the body as shown by Fig. 4, locking the thumbs together. Raise the hands slowly to the position above the head at the same time taking in a full deep breath. When the arms have been raised as high and as nearly in a straight line with the spinal column as the muscular condition of the body will allow, without bending the body, hold them in that position while counting ten pulse-beats. Then slowly lower them, at the same time emitting the breath slowly and regularly, keeping both the arms and the breath under complete control. This and all other exercises recommended should be repeated at each period until fatigue begins to be felt and no longer. When in proper muscular condition, the shoulder and chest muscles will permit of the arms being extended above the head in a straight line, without bending the body either forward or backward.

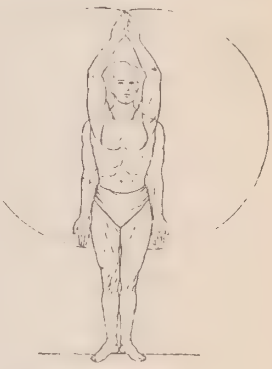

Fig. 5

Fig. 5 is a variation of this exercise. Lock the thumbs as before, raise the hands slowly to the position above the head, hold the breath while counting ten pulse-beats and, while still holding the breath, allow the hands to unlock and carry them slowly down to the sides. Then release the breath, and allow it to escape slowly.

Another variation is gained by locking the thumbs and raising the hands above the head as before. Hold them there for the period of ten pulse-beats, and continue to hold them while permitting the breath to escape during another period of ten pulse-beats. Then slowly lower the arms to the sides, and, while doing so, inflate the lungs to their full capacity. Hold the breath the usual time, and release it with a sudden puff through the mouth.

Fig. 6 is a fine variation of this developmental exercise. Stand as before; raise the arms to a level with the shoulders; bend the elbows, bringing the tips of the fingers together; extend the arms as they were, keeping the hands on a level with the shoulders all the time. As the arms are raised, fill the lungs, and hold them full while making the motions described ten times. Then, with the arms extended, allow them to fall slowly to the sides, at the same time exhaling the breath. The movement of lowering the arms and emptying the lungs should occupy ten pulse-beats.

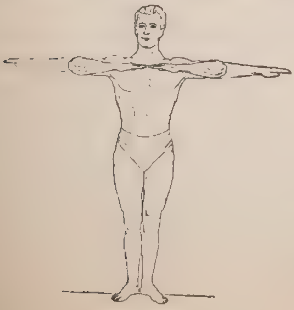

Fig. 6.

All of these combined exercises are especially recommended, since they develop both lung-capacity and the muscles of arms, shoulders, chest and upper back.

When repeated, they should not be performed more rapidly than ten times per minute. Nothing is to be gained by straining.

(*To be continued*)

IS THE STUDY OF BIOLOGY OF ADVANTAGE TO THE PRACTICAL DENTIST?*

By C. M. Wright, D. D. S., Cincinnati, Ohio

THIS question is asked almost daily by the dental student and by the busy practitioner.

It is not always asked in these exact words. One may have in mind Physiology, another Histology, another any subject in medical science, instead of the term "Biology." Biology includes them all.

By Biology I mean the science which treats of living matter in contradistinction to the sciences which deal with non-living matter, such as metals, minerals and wood.

The study of Biology is the study of organisms, i. e., of live creatures, like the amoeba, composed of a single cell, a so-called simple organism; and, like man, a complex organism composed of uncounted millions of cells.

Biology includes the study of the live parts of a creature,—of the living tissues, bone, mucous membrane, dentin, muscle and nerve. It includes all that can be learned about living matter; about its morphology or structure, microscopic and macroscopic; about its natural activities in the condition we call health; about its minute and aggregated reactions to changed environment, and to different irritations; about its variations in function and structure in the condition we define as disease.

Living matter, wherever found, in the animal and vegetable world, and in fungi, is the subject investigated by the Biology, upon which the science of medicine rests. It is classified under the heads of Histology and Anatomy, Physiology, Bio-chemistry, Bacteriology and Pathology, and is the special section of this great science to which I refer in the question asked today.

Is this study of advantage to us practical dentists?

We spend hours and days at a lathe grinding porcelain; we file and scrape and polish vulcanized rubber; we adjust platinum matrices to cavities in teeth, and bake and rebake and enamel little bits of porcelain for stoppings for these cavities. We push and mallet and burnish gold into cavities in teeth with all the careful attention to joints, edges and surfaces that a jeweler must give to a piece of work at his bench. We sit and study plaster models of jaws and teeth for the purpose of inventing some mechanical appliance for expanding a maxillary arch and regulating malocclusion and mal-position of the teeth. This we do for esthetic as well as for functional reasons. In short, we give the best portion of our lives to mechanical work upon a number of mineral and metallic (non-living) materials in the daily practice of our profession. We have felt, too, that all this work with the hands was worthy of our most devoted efforts; that dentistry would not be dentistry without this continual daily application of the laws of physics and mechanics.

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*Read before the West Virginia State Dental Society.

Is it any wonder, then, in view of all this hand work, that the question should at times arise in all seriousness, in each of our minds, "Of what advantage to me in my practice is a study of Biology?" or "What has Biology to do with all this technical work?"

Dentistry is a manual profession. It requires careful and tedious training of the hands. Those clusters of neurons which preside over the movements of the fingers and arms—the co-ordinated contractions and relaxations of muscle protoplasm of these organs—become highly developed in the dentist. The whole trend of his life-work favors the development of the mechanical qualities of brain and nerve and muscle. The problems which are presented to him every hour of his day must be solved by finger craft. His capital is ingenuity and skill. These are the assets which have helped to place American dentistry at the head of the profession of the world. We have become conspicuous and distinguished in every civilized country of the world on account of our marvelous skill and ingenuity, and not on account of our medical knowledge.

When the dentist forgets his cunning and loses his digital skill, and his interest in *how to do* things, dentistry will cease to be useful as a specialty. I insist upon this, notwithstanding the outbreak of pessimism in regard to the mechanics of our profession, indulged in lately by our learned friend, Dr. Talbot. Even modern dental "Prophylaxis" implies skillful hand work. If we accept what I have recalled of the work and life of the dentist, why should we bother about Biology? What has Biology done for dentistry? Is there a sharply defined line of demarkation between "theory" and "practice?" We are in the habit, in speaking and writing, of taking this distinct line as a real thing.

A number of years ago I had the pleasure of meeting a distinguished German dentist in Freiberg, Baden, who had recently visited America and had been highly honored by the National Dental Association of this country. In relating to me the results of his study and observations in America, he said: "The American dentist has it here," and he held up his hand and wiggled his fingers; "the German dentist has it here," and he placed his forefinger on his forehead. This was an ocular and pantomimic illustration of what we oracularly mean by theory and practice. This might have ended the subject had not my esteemed friend added, "Now *I* have been in America and have it *here* and *here*"—fingers and head. I mildly hinted that modesty had lost its place in the scuffle. This caused my friend very much distress, and profuse explanations followed.

I have, in this broadly sketched picture, tried to present, as fairly as I can, the silver side of the shield. I have tried to make plain that one side is of silver, and that this side is necessary in the structure of our dental shield. Now, let us turn the shield and find, if we can, the gold on the other side.

Why do we call our vocation a *profession*—a scientific profession? Why do we, while working every day with our hands, just like any artisan, and fully acknowledging the fact that the skillful touch, the trained hand and the ingenious mind are the most prominent features of dentistry, know, deep down in our hearts, that we are separated by a wide and deep gulf from the best silversmith, jeweler and blacksmith? Why does the dentist know that he is not an artisan, but a professor of an art a professional man?

Let me answer. It is because of the Biology that underlies and permeates and gives reasons for every single act of the dentist in his practice. We are fully armed in many ways to defend as a *profession* against those among us who, with cringing subserviency to their own false idea of the "medical profession," sneer at "mechanics." This is to me an unaccountable attitude for a dentist to assume, for it can be easily shown that the lights of the medical world—the most broadly cultured men in the mother profession, as well as the writers for the medical press—are sincere in their many public and private expressions of high appreciation of the science, as well as of the art, of the dentist. Personally, I should go no further in her defense than by showing that dentistry, modern dentistry, is founded upon Biology.

One statement to sustain this proposition is, *that the dentist operates upon live matter—living tissue.* He carves and shapes living matter, specialized into threads, with antecellular substance arranged as dental tubes, every time he prepares the simplest cavity in a tooth for a filling. He selects and applies his materials for the filling itself with reference to its compatibility with the intertubular protoplasm of the tissue, and with regard to its prophylactic qualities in the hindrance of the recurrence of diseases produced by the specific action of well known bacteria. He performs this most delicate and accurate surgery upon histological elements, the origin of each one of which he can trace back to an embryonic layer in the blastoderm of an oven.

Filling a tooth is a common, every-hour operation of the dentist, and yet it is really what we know it to be, minute surgery and not mechanic's work, for the entire surgical area quivers with life. That live dentin is as much a part of the live man as is his brain, his arm, or his liver. That live dentin gets its share of the beefsteak taken in by the complex organism, man, as food, as do the liver and the brain their shares, and the metabolism of the one is the same as in the others. If we could by some exquisitely accurate instrument (such as Black might construct) measure the energy, the kinetic energy, liberated by this metabolism in a single protoplasmic arm of one odontoblast in a single denturial tubule, we should notice variations, depending upon the quantity and quality of lymph supplied to it as food; and variations, when we cut across it with our excavator or brew, in its response to or reaction against a mechanical imitation; and we cut millions of these living processes in every operation for the preparation of a cavity for a filling.

This proposition may at first glance seem rather far-fetched, but it is not, and is absolutely in accordance with the laws of living matter while alive, and with the facts which the biologist has discovered in regard to every bit of live matter, whether found in animals, plants or fungi.

The surgeon, when he operates upon living matter, has a picture in his mind of the efforts for repair and regeneration which will be made by the neighboring live cells of each different tissue which he must sever. He sees the blood and lymph hurriedly responding to calls from the nerves, bringing with them materials and means for arresting the hemorrhage, for cleaning the wound, for smoothing the ragged edges of supporting tissues, and for erecting scaffolding for temporary use, until the different tissue cells can proceed more deliberately to rebuild the parts after the original plan. The dentist has the same picture in his mind when he operates. The man who does not have this picture in his mind when he touches living matter in any surgical way is the mechanic, no matter how skillfully he may wield an instrument.

I said a moment ago that skill and ingenuity, and not medical knowledge, were the prime assets of the American dentist. Skill and ingenuity are the assets of the great surgeon, and dentistry and surgery are built upon Biology.

The dentist as well as the surgeon must have assets that are immediately available, and skill and ingenuity make these; but we need not be told that the skill and ingenuity of the modern surgeon and dentist would not exist, could never have been acquired, without the labors in experimentation and investigation of the biologist—the anatomist; the physiologist; the bacteriologist and the pathologist.

The skillful dentist of today is deeply indebted to the biologists of the past, and of the present. If we only look backward to those anatomists and physiologists who are called the fathers of modern surgery we shall begin to realize the amount of our indebtedness. John Hunter, for instance, was born only 180 years ago. Pasteur and Chauveau suggested an explanation for the phenomenon of acquired immunity only about thirty years ago. Metchnikoff startled the world with his theory of phagocytosis only twenty-five years ago. Ehrlich published his epoch-making theory on the side chain (seitenkeltentheovis) about twelve years ago, and the dentist has been as keen in acknowledging and appreciating the labors of these and other biologists as have practical physicians and surgeons.

The leaders in modern dentistry today are not only skillful operators but good diagnosticians. They know *how* to operate and they know *why* they operate. This "why" has been gained by a deeper study of the fundamental principles of Biology.

This knowledge of Biology stimulates and awakens the "pathological sense." Now, while we admit that our entire superstructure rests on Biology, I am well aware that the busy dentist, wearied with his labors on the building itself—the visible portion which is above ground and which stands out like a skyscraper, a grand sight often fails to look after the foundations, the portion which seems to be shrouded in mystery. He is too tired to go down in the cellar and subcellar and satisfy himself of the soundness, the strength, and, I will add, the beauty of this basal portion of the building. Some hesitate to go down because they have almost forgotten the way since their college days. Would it be presumptive if I should try at this time to direct these to the cellar?

First: Get out your modern text-book on Histology or Physiology, and give your attention at odd times for some weeks to a thorough study of the structure and properties of protoplasm—living matter. Study the life history, of a simple celled organism, like the amoeba. Don't attempt to go down one step further until the little creature is so familiar to you that you can see it and recognize its vital phenomena in your mind's eye whenever you think of a lung or a kidney, a brain or a liver, a muscle or a bone, and can cry out, "Hello! Here you are, Mr. Amoeba (specialized as a neuron, or as a bone cell, or as an odontoblast), living the same life in relation to food, waste and energy (though the manifestations of energy vary) that you did when you were free from your present special occupation, and unaffected by your present special environment." A little mass of live matter, with all the innate qualities of metabolism, of imitability, of contractility, and of reproduction.

Second: After acquiring this familiarity, look up the different kinds of elemental tissues of the body. Look up the localities and surroundings of epithelial tissue, of the several varieties of connective tissues, of muscle and nerve tissues.

Third: After observing all the points in the little fellow's healthy actions and reactions on these different locations of the body, study the effects of bad air, bad food, cold, heat, light, poisons of various sorts, and mechanical injuries, upon these small bits of life. Study the bacterial enemies of our small cell, and observe the powers of resistance it possesses in itself. This is the pathology of it.

I need go no further, for after this the way becomes easy. This is the most direct route to the subcellar of our building. We may now continue our strides and go on to investigations into physiological chemistry and pathological morphology, and the practical application of therapy and prophylaxis.

This study gives an immense amount of satisfaction, and to the tired dentist it gives a pleasure greater than can be had from Galoreaux or Conan Doyle.

It also awakens gratitude toward every investigator in the different departments of Biology; and, what is particularly valuable, it inspires us with a higher opinion of and a deeper respect for our daily work. We become optimistic and enthusiastic, practical dentists, with never a regret that we have not annexed to our names the letters "M. D." by early studies in a medical college, or by the courtesy of some struggling and possibly irregular medical school; for we know that even the title "D. D. S." can be only of real value and meaning to the persistent student in this, our department of medicine.

I added this last sentence or two to the paper while on the train, because of a little talk with Dr. McGee, who has lately come from Richmond, Va., and taken a teacher's position, a professorship, in the Ohio College of Dental Surgery.

He told me yesterday of the efforts of a number of the members of the profession in Virginia to make the medical degree, the M. D., a qualification for entrance to a dental college.

From my standpoint and viewpoint such an act would be the death blow to dentistry. It would be an act favoring degeneration, and not normal, healthy development. We have reached our present position of honor among the specialists of medicine by a determined, independent and honorable work by many men whom we are proud to enshrine in our memories. Our traditions we hold as a sacred inheritance. By losing our identity, our distinct and unique position, and becoming a fragment, a ragged edge of the medical profession, we should soon feel that we had indeed sold our birthright for a mess of pottage.

The practice of medicine cannot prepare a man for the practice of dentistry any more than the practice of dentistry prepares a man for the practice of medicine. Yet we are as free today as we have been from the beginning of the history of dentistry to absorb every new discovery or doctrine in general pathology, in connection with the modern specialist, general physician or surgeon. For, as I have tried to show in this little paper, dentistry is securely founded upon the principles of Biology.

Two distinct buildings—one the art of the physician and surgeon and the other the art of the dentist—have been reared on the same foundation. Each has its separate college.

DISCUSSION.

Dr. C. H. Bartlett: "Dr. Wright has clearly shown that the study of biology would be greatly to the advantage of the practical dentist, especially from a pathological and histological point of view; but if that knowledge is not acquired in college before he starts into practice the question arises, would it be *enough* to the advantage of a hard worked, practical dentist with a successful practice, with only a limited knowledge of the science, but enough to enable him to treat all common diseases of the teeth and membranes of the mouth satisfactorily to himself and his patients, to spend much of his valuable time in the study of Biology?

"The doctor very truthfully says: 'We give the best portion of our lives to mechanical work;' also that 'dentistry would not be dentistry without this continued daily application of the laws of physics and mechanics,' and that ' the problems which are presented to him every hour of the day must be solved by finger craft.' And now, with the satisfactory assurance that this finger craft, ingenuity and skill, has placed us at the head of the procession of the whole civilized world, is it strange that the question should be asked, 'What has Biology to do with all this technical work?' This honorable distinction has not come from our profound knowledge of Biology. We might know a great deal about Biology and not be able to put in a passably good amalgam filling, or make an ordinary rubber denture. Then we would say the study of Biology is of no special advantage to *this* practical dentist. (There are a great many of this *special brand* in our country.) But, again, if the practical dentist is well equipped with mechanical skill, ingenuity and instruments, and able to do the work, then his knowledge of Biology is a valuable asset. This knowledge should be acquired before he enters into practice, instead of going to the 'cellar' and way down into the 'sub-cellar' with his 'modern text-book' for the study of Biology, when he is so tired and sleepy from a hard day's work he can hardly keep his eyes open. The busy, practical dentist has very little time for such study, if he has a small family of seven or eight children to feed and clothe, besides office and house rent to pay.

"Dr. Wright says, 'The skillful dentist of today is deeply indebted to the biologist of the past and present.' He is not only deeply indebted to the biologist, but as deeply indebted to the man who has invented the instruments to do the work with. These things all have to go hand in hand; as Dr. Wright says, 'We must know how and why,' and also be able to do the right thing at the right time.

"There is not a shadow of doubt about the advantage of Biology to the busy practical dentist. It better enables him to understand Histology, Pathology and all the other ologies, and to more intelligently diagnose any case without hesitation coming into his hands.

"I want to thank Dr. Wright for all the valuable points and suggestions given us in his paper. He closes by directing us to the cellar with our modern text-books. This strikes me as rather presumptive, to ask a tired, overworked dentist to sit down to hard study, when he wants to look over the late journals to know what is going on in the outside world, or perhaps take a little rest and recreation with his good wife (if he is so fortunate as to have one; if not, his best girl). Just think how much better fitted for the next day's work he would be; how much happier his good wife would feel after spending the evening at the theatre, or taking a street car ride (I hardly dare suggest that he might be the happy possessor of a horse and buggy or an automobile), than if he had been studying Biology in the sub-cellar."

Dr. D. Willard Flint, Pittsburg, Pa.: I have enjoyed very much listening to the reading of this paper. I want to add what Dr. Kirk said in Pittsburg, "You cannot separate theory and practice;" and he showed how some foundation subjects were absolutely necessary if we are going to build even our mechanical part. To make a well rounded man we ought to know something other than what we do every day. So I believe the dentists ought to have some of these theories, and I think the more we know the more pleasure we have in subjects we are interested in. Too many of us forget some of our study of the "ologies," but I believe we ought, in order to be well rounded men, to keep them up, so that we will be able to intelligently discuss everything along that line. I believe some of the rhinologists would be helpless to do some of the things they do if they did not have the help of the dentists in making good, live, healthy tissues in living subjects, and I will show you tonight where they fall short and how you can help them out.

Dr. C. M. Wright, Cincinnati, Ohio: I have nothing to say excepting to thank the society for its kind reception of my paper and to thank the gentlemen who have so favorably discussed it.

Dr. Bartlett made a remark that a fellow doesn't want to go down in the cellar after he has been working all day and study the sub-cellar. I agree with Dr. Bartlett, but must ask how can the tired man enjoy his monthly dental journals unless he keeps up his knowledge of these foundation subjects? It seems to me our technical professional journals have come up to the point where they infer that their readers are familiar with just these things. Some of my friends have said, ''I don't grasp these medical propositions. I don't remember the fundamentals.''

That is why I was so presumptive and tried in my little paper to define an easy method of getting near to them. When Atkinson used to write and to speak and tell wonderful stories of pathology we used to go around and say: ''Did you ever hear such a thing! What does he mean? I don't understand his language!'' But, little by little, many men began to read up in order to understand Atkinson, and they became interested, and some of those very men whom I remember laughing at Atkinson's ''high- fallutin' '' talk forty years ago, did not forget his ''ghost stories,'' and gradually knew more about these ''ologies'' than did Atkinson himself. Dentistry has advanced and is advancing along these lines, and one point I wanted to make was that we are deeply indebted to these older men who did study these very things: namely the fundamentals of medicine, *after* they left college. We are indebted to them for everything we do today so well in our beloved profession.

Why, Dr. Flint can criticise, as he did today, a rhinologist, because of his own knowledge of Biology.

We are not alone in getting worn out and tired by our daily tasks. The physician and surgeon—all men who work in these modern times, get awfully tired every day. They would rather go to the theater or play, or read an exciting detective story (my specialty in literature) than sit down and study, but I insist that by beginning at the beginning, as I have suggested, one will soon enjoy reading about the poor little amœba as much or more than he will about ''Other People's Money'' by Gaborieau, or Sherlock Holmes by Conan Doyle, or any other very exciting detective story.

CONSERVATIVE SURGERY FOR THE TREATMENT OF DISEASES OF THE MANDIBLE*

By Thomas L. Gilmer, M. D., Chicago, Ill.

EXSECTION and resection of the mandible are followed by greater mutilation and disfigurement than follow any other oral or facial surgery. When the continuity of the lower jaw is broken by the removal of considerable sections of the bone, facial deformity is at once and permanently made, and no means of restoration by prosthesis, or otherwise, has as yet been suggested or employed, which meets the demands either cosmetically or functionally in any degree satisfactorily, either to the surgeon or to the patient. This statement may be qualified in a slight degree by excluding a few cases in which only a small section of the mandible has been removed in the anterior part of the bone, and there are present in the two fragments of the jaw a number of good sound teeth firmly set to which a bridge may be secured; and even in such cases, owing to the heavy strain to which such teeth will be subjected, it is unreasonable to expect them to withstand permanently the necessary strain of mastication without finally becoming loosened and lost.

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*Read in the Section on Stomatology (A. M. A.) of which THE DENTAL SUMMARY is the representative organ for the dental profession by special arrangement with the Jour. Amer. Med. Asso.

Those who have made staying appliances for this purpose realize the many difficulties in the way. Muscular force necessary for ordinary mastication exceeds the strength of any rigidly applied fixture. That such fixtures are frequently broken by the patient, even when they are most scientifically and carefully constructed, is well known. Muscular traction on the remaining portions of an exsected mandible, in ordinary mastication, causes an outward rotation at the base of the bone, through the action of the masseter muscle on closure of the mouth, and the mylohyoid muscle turns the base of the jaw inward when the mouth is opened. If a rigid appliance is used for the support of the two remaining portions of the jaw, the metal employed for this purpose, if used in size practicable in the mouth, will, by reason of long continuous strain, crystalize and break, no matter of what metal it may be constructed. To construct such an appliance sufficiently strong to withstand mastication and not to loosen the teeth, joint must be employed on each side so that the two parts of the bone may have some free movement, thereby putting less strain on the metal connection and teeth to which it is attached.

As you will note, reference has been made to prosthesis for the most favorable cases only, that is these in which a section has been removed from the anterior portion of the jaw. If the continuity has been broken by removal of a considerable section in the posterior portion of the jaw on one side or the other, the difficulties are greatly increased. If the remaining portion of a jaw in such case is supported and held in its normal position until cicatrization has been completed, about all has been done that can be done in such cases. This may be done by wiring the teeth of the longer fragment to the corresponding teeth above, or by soldering a flange to bands cemented to the teeth of the remaining portions of the lower jaw in such a manner that when the mouth is opened the flange will rest against the buccal surfaces of the upper jaw, preventing cicatricial contraction from displacing the remaining part of the bone. Even though one of these methods be adopted, the function of the remaining part of the jaw is extremely poor. Following resection of the entire body of the jaw or even one-half of it, there is little hope for artificial restoration which can promise great value, either for mastication or for cosmetics.

When the surgeon realizes the truth of the foregoing statements he should be slow in deciding on an operation so radical as exsection or resection. He should be sure that the life of the patient can be saved only by such an operation; and I am of the opinion that it is good practice, even in some malignant types of disease, unless the bone throughout its entire thickness is involved, to do an operation which will save at least a small part of the body of the jaw in its continuity, taking some risk of recurrence rather than maiming the patient for life. Take, for instance, the most prevalent type of malignant tumor of the mandible, the giant-cell sarcoma. Since in this type of sarcoma metastases are not early formed, a conservative operation may first be done, then the case subjected to ray energy and watched closely. If the growth recurs, it is not yet too late for the more radical operation.

My experience has been such that I feel fully justified in this procedure. I have, in several instances, removed most of the jaw, leaving for support a sufficient part of the bone in which the diagnosis of giant-cell sarcoma had unmistakably been made, and there has been no recurrence after a period of fifteen years. I have done a much larger number of operations of this kind for similar cases, which after several years there is no indication of return. Unless the disease has progressed so far that an entire section of the bone is involved, I save that part which appears uninvolved, and feel justified, though there should occasionally be recurrence.

Good surgery is thorough surgery, but it does not necessarily follow that surgery to be good must always be radical. Diagnosis in mandible cases is all-important. A case was shown at the Chicago Medical Society by Dr. Carl Beck in which an entire lower jaw had been removed by a surgeon for the cure of what was supposed to be a malignant affection. After the mandible, in its entirety, had been removed, it was discovered that the condition was simply one of necrosis. In this case had greater care been exercised in diagnosis and had Nature been assisted, the formation of the jaw would have been so complete that there would have been but little deformity, and sufficient bone would have been rebuilt to support a prosthetic appliance.

In some instances in which diagnosis of necrosis of the mandible is correctly made, some surgeons feel that a radical operation is needed, and at once, before Nature has separated the dead from the living bone, proceed to perform that service for her with the result that an additional area of healthy bone is involved and in some instances destroyed. Had the case been closely watched, properly drained and irrigated, the dead bone would have been thrown off and in the meantime the osteogenetic influence of the periosteum would have been at work forming a new and serviceable jaw If in cases of necrosis of the mandible the surgeon anticipates Nature's work and cuts away the dying bone, new bone is not formed to take its place, and permanent disfigurement and functional inactivity of the jaw is the unfortunate result.

The so-called epulis of the jaws, a benign tumor of connective tissue origin, may histologically simulate sarcoma. To remove large, or even small complete sections of the jaw in such cases, is to inflict unnecessary suffering on the patient. I have removed scores of such growths, taking with them only a part of the alveolar process, and they have not returned.

I am no advocate of temporizing with malignant neoplasms: but, to be sure of the diagnosis, then radically to remove all of the invaded tissue so far as we can judge, saving, if possible, a small part of the jaw in its continuity, is not temporizing.

For cosmetic reasons operations on the jaws, when they may be thoroughly and completely done from within the mouth, should be done that way, but if the disease is of a malignant nature a clear field with unobstructed light is necessary to enable one to judge of the extent to carry the operation, then an external incision should be made. Such incisions may usually be made in a manner to cause the minimum of disfigurement.

ABSTRACT OF DISCUSSION.

Dr. George V. I. Brown, Milwaukee: The thoroughly practical views that Dr. Gilmer has presented of the difficulties encountered in endeavoring to overcome the mutilation and disfigurement that follows resection of the mandible, based as they are on his long experience and successful results in oral surgical practice, commend themselves to our best consideration and adoption. Of course, we all know that the only hope at present for greatly benefiting growths of the more malignant types is early diagnosis and complete radical early operation at a time this may be done without total destruction of usefulness of the parts. It is no kindness to a man to resect his lower jaw, or a half or two-thirds of it for the sake of giving him the bare possibility of one or even two years additional life. I do not consider life worth living under conditions such as those in which I have seen patients endeavoring to exist after operations of that character had been performed. When the question of resection of the jaw for cancer arises in my practice and there is on the one hand perhaps the temptation to do a big operation with doubtful prognosis, the thought comes to me. "Would I desire to have that done to myself? Would I wish to live under such circumstances?" and most of the time I think that I would not.

One of my cancer patients was saved, I believe, by Dr. A. J. Ochsner, of Chicago. The growth was situated in the region of the maxillary sinus of a patient for whom I had previously done a radical operation for empyema of that sinus. At the time I was suspicious of a tiny spot not quite so large as one's little finger nail. In accordance with my custom, I had sections made and under the microscope it proved to be cancer. For several months the patient got on well. Then he had a recurrence. I knew if anything was to be done with the knife it must be a removal of the entire upper jaw. Instead of this I took the patient to Dr. Ochsner and he burned the growth out. The operation was done without an external incision. Twenty or thirty soldering irons were heated, the patient was anesthetized, and these irons thrust, one after the other, into the opening, which already existed in the sinus. This was repeated until the tissue in every direction was burned to the utmost limit that one would dare to force the iron. It was necessary to burn this patient on two different occasions and sequestra of bone came out for months afterward, but from last accounts the man was still living happily, and I feel sure that he would not have been living at this time had other methods been pursued.

I am convinced that there is no operation that can be done with the knife in the way of resecting the jaw, upper or lower, that will come so near taking out all the tissue that is malignant or has a tendency to malignancy, or will so nearly overcome the tendency to recurrence of the neoplasm, as will burning with soldering irons. This operation is disagreeable for those who operate and very much so for the patient afterward, but its great advantage lies in the fact that one could not so safely do so extensive an operation with the knife; hemorrhage in other kinds of operation would, in all probability, be very much more serious, and by this method of treatment tissue is destroyed in advance, so that it continues to slough out for a considerable period of time. Thus we have micro-organisms concerned in tissue destruction, warring against and destroying the tendency to proliferation of cancer as of other cells, and this seems to exert a beneficial influence.

With the great advancement that is being made in the study of both carcinoma and sarcoma, we all hope for better methods of treatment in the near future. In the mean time, in my opinion, there can be no question of the value of the suggestion that Dr. Gilmer has given us today. The same principles apply with even greater force to the treatment of necrotic conditions of the mandible, because with these the surgeon, by the skillful use of suitable instruments, proper drainage, and reasonable time to allow Nature's curative and reconstructive processes to assist, should in most instances be able to control the operative conditions sufficiently to avoid hideous external scars, and seriously deformed, more or less useless jaws that so frequently result from unnecessarily rapid improperly performed operations.

Dr. T. L. Gilmer, Chicago: I spoke of certain tumors of the mandible as so-called epulis. This tumor is not malignant. There is another tumor of the jaw, sarcoma, known by the same name which is malignant. Epulis is a compound Greek word meaning on the gum; therefore is not a suitable name for either growth. Neither of these growths spring from the gums, but are of connective tissue origin and usually originate in the bone or periosteum. Epulis to the pathologist means a malignant growth. It is a misleading name and should be abandoned. Microscopically some of these non malignant growths show sarcomatous cell formation.

The stomatologist should ever be on the alert to detect disease of the mouth early. Since he is seeing the mouths of his patients frequently he may discover abnormal conditions before they have gone too far to remedy, without serious deformity or loss of life.

ARSENIC*

By Robert Zugsmith, D. D. S., Pittsburg, Pa.

WITH the possible exception of a slight reference to the treatment of roots and their ultimate filling, it is not my intention to digress to any extent from the subject of the live pulp and its removal, either by means of devitalization with arsenic or by anaesthetization with cocain. I wish to deal principally with the former, showing in an unprejudiced way its method of application, its form of action, considering both its advantages and disadvantages, and last, but by no means the least important, to compare it with the use of cocain in the removal of pulps. What statements I make are founded on my own experience and are the result of close and patient observation. I shall, no doubt, differ in many ways from previous writers on this subject, but I shall, nevertheless, present my views without fear.

The active principle of all devitalizing agents is Arsenic Trioxid (AS_2O_3) formerly and improperly called Arsenious Acid. It is a white powder and rather difficult of solution. Its use as a devitalizing agent was discovered by Doctor Spooner, of Montreal, in 1836, who found that by its application for a few days the most sensitive dentin could be obtunded perfectly. However, the pulps of teeth so treated invariably died at a subsequent time, and this finally led to the general use of arsenic as a devitalizing agent; since that time it has stood alone as a safe and a certain method in the removal of live pulps and not until recent years, since the introduction of pressure anæsthesia, has its supremacy been questioned.

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*Read before the Lake Erie Dental Society, 1910.

Almost since the inception of its use, arsenic has been mixed with other drugs, among which the principal are morphin, cocain, thymol, creosote, phenol and oil of cinnamon. The most recent formula is that advocated by Dr. Buckley, which is as follows:

Arsenic Trioxid, 1 drachm; Cocain, 10 grains; Thymol, 5 grains.

The accompanying drugs serve a double purpose:

(1) They dilute the arsenic to such an extent that a vastly smaller quantity can be applied than if the arsenic were in a pure state. This is a point of the utmost importance which I shall show farther along.

(2) By their use the arsenic may be made into a paste, in which form it is more readily handled.

It is also claimed that morphin and cocain act as anodynes when so used, thus overcoming any tendency of the arsenic to produce pain; but this seems hardly plausible when the local action of these drugs is considered.

Morphin has no analgesic action when applied locally, and to produce its effects must be introduced into the circulation. Now, if when applied to a pulp in connection with arsenic it were to be absorbed, the effect would not be of a local nature alone, but would produce all the general effects derived from the use of morphin. This certainly precludes the possibility of morphin overcoming the painful effects of arsenic.

Now, let us take up cocain in the same manner and consider its usefulness as a means of allaying pain in this connection. It is true that cocain, when applied to soft tissues, is a local anesthetic. But often arsenic is applied in the cavity where no exposure of the pulp exists, placed squarely against solid dentin, a substance so hard and dense that great pressure is required to force even a liquid through it. Cocain in solution will not penetrate it except under extreme pressure and even then only to a limited extent. The anodyne effects of cocain are rare, indeed, when used to reduce a hyperæmia of the pulp. Then why should so much be expected of the drug when used in connection with arsenic? And on the other hand, taking into consideration the fact that cocain contracts the local capillaries, while arsenic dilates them, it would seem that use is being made of two drugs physiologically incompatible. So it is seen that neither morphin nor cocain accomplishes the purpose for which intended when used in connection with arsenic for devitalizing purposes. This I have proved to my own satisfaction, using the arsenic, alone, mixed to a creamy paste with creosote, and have found that the percentage of cases in which pain was produced was not greater than where the arsenic-morphin or arsenic-cocain combination was used.

So we must bear in mind that arsenic is the essential agent of the devitalizing mixture and that the other constituents play little or no active part.

It is a well known fact that arsenic is the most certain devitalizing agent there is—more certain in its action than cocain, and in fact so sure and unfailing in its action is it, that it might be termed a specific. Knowing this to be so, let us consider now the disadvantages of its use and attempt to show how they may be overcome. They may be grouped under these general heads:

1. Pain.

2. Escharotic action on other tissues with which it may come in contact accidentally.

3. Possibility of the action extending beyond the apical foramen producing necrosis with its attendant dangers.

In considering the question of pain, I am forced to admit that there are occasional instances where pain of a most severe nature is produced, no matter what care and judgment are displayed in applying the arsenic. However, these are rare, indeed, so much so that they may be passed over with but slight attention. If arsenic is applied in the proper manner and with as much skill and judgment as we use in other operations, severe pain need not be considered and we may rest assured that at the expiration of the proper period of time that the pulp will be lifeless and resolve itself into a problem of removal.

For convenience of manipulation arsenic is prepared in various forms, among which are the following:

1. A paste for which purpose creosote is generally used.
2. Cotton fiber impregnated with arsenic.
3. Small squares of cardboard coated on each side with arsenic.
4. Fiber finely cut and thoroughly mixed with a colored arsenic paste.

Cotton fiber of the ordinary form is difficult to control and seal into the cavity perfectly. It is almost impossible to seal it into a small cavity without a stray end or two escaping notice and extending over the margin.

The cardboard squares are also difficult to handle, in as much as the arsenic is not adherent to the cardboard and scales off on the slightest pressure, thus making it almost impossible to carry accurately to place without having particles fall in other places.

The form I have found of the most convenience is the paste composed of arsenic, morphin and creosote. If this mixture is allowed to stand, the solid constituents are precipitated, leaving the creosote free on top. It is necessary, then, on using to stir thoroughly each time; but a better way is to pour off the creosote on buying the bottle, thus leaving the arsenic and morphin remaining. In a short time this becomes a perfect solid, white in color, due to the further evaporation of the creosote, and a piece of any size may be chipped off with an instrument and removed from the bottle very readily.

Before proceeding further it will be well to consider the application of the arsenic and the different causes for its use. These may be divided into two classes:

1. Those of necessity.
2. Those of convenience.

Under the head of necessity may be placed those in which the pulp is exposed for any reason and capping is not to be considered. Where decay is so deep that its thorough removal would expose the pulp. Those in which the pulp is in a pathological state which cannot be overcome by the application of the ordinary anodynes. Those cases in which on account of extensive abrasion or erosion the pulp is constantly subject to shock. And those in which the pulp is so nearly exposed that a large metal filling would ultimately cause death.

Under the head of convenience would come teeth which are to be crowned. Those in which pyorrhoea is present and for some reason the pulp is to be removed. And those in which it is found necessary to use the root canal as a means of retaining a large filling.

It is not necessary to have an exposure in order to insure the devitalizing effect of arsenic. If the smallest appreciable particle of the drug is placed in contact with the dentin and retained there for a sufficient length of time, the end will be accomplished equally as well as when placed directly upon the pulp, and in fact in some respects better, for there is less liability of pain when arsenic is not placed in contact with the pulp. Even when the pulp is covered by nothing but decayed dentin it is not necessary to secure an exposure for the arsenic will act just as thoroughly through such tissues as through sound dentin. So this principle may be laid down: Where the case demands the application of arsenic and no exposure of the pulp exists, do not produce one.

When a sound tooth presents itself as in the case of an abutment for a bridge, drill a cavity with an inverted cone bur only to the dentin and no farther, making it as wide laterally as is necessary for convenience in applying the arsenic and at the point which is most accessible for the removal of the pulp. Where a cavity exists, it is necessary to open it sufficiently to remove the loosened debris and secure a retentive form for the filling used to retain the arsenic. When an exposure exists it is well to apply the arsenic at a point distant and lightly cover the former with a small piece of spunk before placing the stopping in the cavity. According to the present teaching, which is generally accepted, arsenic should not be applied to a tooth in which pain is present, but instead, all hyperemia or congestion should be removed, first by the application of creosote, phenol, one of the essential oils, or some other anodyne used for the purpose, sealed in the cavity for 24 or 48 hours. In some cases where the condition is extreme and the symptoms marked, it is found that the pain refuses to respond to any such treatment. Even pricking the pulp to cause bleeding in order to relieve congestion is found unavailing. It is here that I wish to say, even though contrary to commonly accepted methods and with no attempt at explanation, that an application of a small amount of arsenic will dispel the pain and produce death of the entire pulp in from 2 to 5 days.

It is rare that arsenic will devitalize a pulp in 48 hours. Almost invariably, if the pulp is opened in that time, it is found to be still highly sensitive and another application is necessary. As a rule arsenic should be sealed in for from 5 to 7 days before its removal, when the pulp will be found lifeless. Of course, I am referring here to adult teeth where the root has been fully formed and the apical foramen is small. Very little of the arsenic is absorbed by the pulp and its action will not extend beyond the foramen. Besides being demonstrated clinically this was plainly shown by Miller in his experiments on rats.

Now, in regard to the technique or procedure in the application of arsenic. A canal plugger from which the temper has been drawn is filed down to a round point of about 20 gauge and bent to a convenient angle. This is dipped into creosote for a short distance and what clings to the point placed on a clean glass slab. With the same instrument a small portion of the solid arsenic-morphin mixture is removed from the bottle and mixed to a creamy paste with the creosote on the glass. Here, I wish to say that it is not necessary to use the rubber dam in this connection. For a man who has skill, dexterity and confidence, cotton rolls or napkins are sufficient to hold the saliva in check for the little time it takes to apply arsenic. That is the only obstacle that needs attention, for if the man does not possess the skill requisite to place it exactly where it should go and in no other place, he is not fit to use the drug and should accomplish his ends by some other way in which more latitude is permissible. Besides, we must bear in mind that there are many cases in which it is impossible to use the dam, and when it is necessary to depend on absorbents to keep the cavity dry. Much more time is consumed in keeping the mouth dry in setting an ordinary bridge, and yet no man shows signs of nervousness or doubts his ability to succeed without the rubber dam. There are so many terrible tales of necrosis from the misuse of arsenic that many men are frightened before they use it, but I wish to say that it is a drug easily and surely handled and almost certain in action, and if the evils resulting from cocain were compared with those from arsenic the balance would, in all probability, be placed to the credit of the latter.

Before applying arsenic it is necessary to thoroughly dry the cavity and keep it dry. A portion of the paste as small as possible is now taken on the extreme end of the plugger and carried carefully to the cavity, where it will leave the plugger readily and cling to the cavity wall. If an exposure exist, thin cement should be used as a retaining agent, since it can be inserted without pressure more readily than gutta percha. If there is no exposure present, gutta percha in the form of temporary stopping will answer all purposes, but in either case they should be brought only to the margins of the cavity and no attempt made to restore contour or the contact point.

The pulp chamber should be opened in 6 days or before if any tenderness is noted on pressure. Where the pulp has become devitalized earlier than expected or where it has been permitted to remain in this condition for 24 hours or more, a hyperemia of the pericementum is produced and the tooth is most exquisitely sensitive to pressure and to the slightest change of temperature. This is not due to any direct action of the arsenic beyond the apex of the tooth, and can be relieved almost instantly by opening freely into the pulp chamber and removing the arsenic, then sealing in without pressure any anodyne of an antiseptic nature, such as creosote, or phenol, for a few days.

When the pulp is removed, the canal should be packed with cotton moistened with non-irritating antiseptic, and sealed for from 2 days to a week. At the expiration of this time the cotton may be removed and the canal safely filled. I wish to call attention here to the fact that when the cotton is removed, considerable debris in small particles is found clinging to it, showing that the pulp has not been removed entirely. This debris is probably a portion of the odontoblastic layer which has been more adherent to the dentin than to the pulp, and is an argument against immediate root filling. And it is also this fact which is sufficient alone to make arsenic far preferable to cocain as a means to removing vital pulps. When cocain is used the pulp is not devitalized and this layer still vital is left adherent to the wall of the canal when the pulp is removed. This does not slough away in a few days' time as it does where arsenic is used, but is felt to cause soreness oft-times after the root is filled. And this is also the reason that it is difficult sometimes to enlarge the canal in a tooth so treated, for a pin or dowel, without causing severe pain. The life here persists often for many days and the tooth responds quite noticeably to thermal changes even after the root is filled. All pulps are not susceptible to the action of cocain and there is much pain produced in these cases when repeated applications are made to produce anesthesia. Cocain is often forced beyond the apex of the root, not only causing permanent injury to the delicate tissues in the apical space, but desensitizing them for the time being, thus rendering impossible their ability to respond when the broach is forced through the apex of the root.

Another disadvantage in the use of cocain is that hemorrhage is almost invariably produced when the pulp is removed. This is a problem to control sometimes, and the blood that dries on the walls of the cavity and in the canal is rather difficult to remove without staining the tooth.

Summing up, it is found that arsenic and cocain may be compared as follows:

1. Arsenic is more certain in its action than cocain.

2. It requires less time on the part of the operator to devitalize and remove a pulp with arsenic than by use of cocain.

3. It is a cleaner operation than is the use of cocain for there is seldom any hemorrhage.

4. There is practically no danger of injury to the tissues of the apical space by the use of arsenic.

5. There is less possibility of leaving any remnants of the pulp in the canal where arsenic is used.

DISCUSSION.

Dr. J. A. Rupert, Meadville, Pa.: I have not used arsenic but once since 1904, so you will agree that I am abundantly unable to discuss arsenic from a clinical standpoint.

I wish to comment, however, on the reasonableness of the essay as presented, namely the value of the compound as usually used and the little benefit we need expect from the incorporation of morphin, cocain, etc., also the method of application, for the essayist has well said that the dentist who could not apply such a drug without the use of the rubber dam had need to question his ability in any operation. The more easily we accomplish the results for our patient the better we have served them.

I feel sure that the method advocated by the writer is ''the best method'' for the use of the drug and that the time he gives for devitalizing is very practical, but when he draws a comparison with cocain I must differ with him in that hemorrhage is not a detriment, arsenic is not more certain and in my hands cream requires less time rather than more.

Dr. H. W. Heckel, Pittsburgh, Pa.: I wish to congratulate the essayist on his commendable paper and stand which he takes on this interesting subject. This, however, does not say that I agree with him in all that he has told us.

Arsenic as a devitalizer is combined with other ingredients to meet two objects: 1st, convenient form for application; 2nd, to lessen the pain of its action. The form preferred is that of a paste, which is made by mixing sufficient quantity of a volatile oil, cresote or glycerin with the arsenic.

To lessen the pain of devitalization a number of drugs have been used, but the list can be narrowed down practically to one, and that is cocain hydrochlorate. It possesses every quality that is essential, without serious disadvantage. It is soluble, it mixes with the substance used in a paste, and is more efficient than any other agent. The danger of absorption into the general circulation is so slight that it may be disregarded, any quantity not exceeding one-fourth of a grain may be regarded as safe to use.

The pain in connection with devitalization of a pulp depends somewhat upon the conditions. A healthy pulp that has not become irritated, may be destroyed without *any pain*, but in the average case where irritation has occurred, it must be expected that within a short period of time after the application, the patient will experience first a gnawing, and later a throbbing, which will continue until the pulp is destroyed.

The essayist lays particular stress on the paste of morphin and cocain hydrochlorate. I prefer the latter. I would like very much for the essayist to tell me why he prefers the paste of arsenic, morphin and creosote above all the others, when he himself admits that morphin has no analgesic effect on soft tissue, and has to be taken into the circulation, where on the other hand, he admits the analgesic effect of cocain and disregards it altogether. The essayist seems to lose sight of the fact that after the arsenic acts on the dentin it is no longer that hard substance that it was before the arsenic was applied. I will admit that cocain must be used under high pressure to affect sound dentine, but when we are using arsenic with cocain on dentin it is no longer that same hard substance it was before we started our operation.

I agree with the essayist that it is not necessary to have an exposure to ensure the devitalizing effect of arsenic, but I do say get an exposure wherever you can, and place your arsenic over the exposure and you will find that the cases will not be rare where devitalization does not take effect in 48 hours.

In regard to the application of arsenic, I think it a waste of time in applying a rubber dam in most cases. I think the same as the essayist in regard to a man who cannot control the saliva for that period. In sealing arsenic in a tooth I think cement should be used for the reason that you overcome pressure, for that is what you do not want, and it will not be chewed out by the patient.

I think it a mistake to leave a root canal unfilled any longer than possible—my experience is to fill as soon as the pulp is removed; my method of devitalization is to get an exposure if possible, then place your arsenic in the cavity over the exposure from 36 to 48 hours. Then remove that and place a treatment of glycerite tannic acid in the cavity for about the same time and then you can remove the pulp in a mass without trouble to yourself or patient; dry the canals thoroughly, then moisten with a little oil of eucalyptol and insert your point.

Regarding cocain devitalization, I think there is nothing better for the anterior teeth, and you save time in using it—as far as having trouble with anesthetizing the parts beyond the apex, I think they are rare. It is oftener that we do not anesthetize far enough, and in case we should, I have not heard of an evil result. In the summing up of arsenic and cocain—1st, I don't think arsenic any more certain than cocain; 2nd, nor that it requires less time on the part of the operator to devitalize; 3rd, it is not any cleaner; 4th, there is no more danger of injury to the tissue of the apical space than with arsenic; 5th, the possibility of leaving any remnants of the pulp in the canal are no more or less than with arsenic.

THE IMPORTANCE OF DENTAL RECORDS

By Butler W. Donaldson, D. D. S., Lorain, Ohio

An article which appeared in your February issue of THE DENTAL SUMMARY under correspondence, by Dr. C. W. Benson, deserves recognition, for dental records are not only a great help to the busy practitioner, but an absolute necessity.

For some years I have made a practice of keeping records of all work done, even making notes of the different medicines used and kinds of alloys and cements, etc. In this way one can tell which make of cement has proven the most durable, and what treatment and capping materials have been a success.

Dr. Benson states in his sixth paragraph that a broken appointment for setting a crown or bridge may cause an arsenical application to be overlooked, in some other tooth. The record cards *do* prevent this as he says, but another check for this occurrence is to always mark the nature of the operations on the appointment book, by using abbreviated terms or symbols.

As an instance of this we will suppose Mr. Brown has an appointment for Monday morning at 9 o'clock for removal of an arsenical dressing in a lower right first molar, and for setting a gold crown on an upper left second bicuspid. The appointment book would be read as follows: 9, Mr. Brown, As. 6, g. crown 5.

In the above case the chemical symbol is used as an abbreviation. At the end of the day's work all entered accounts are checked off and the broken appointments noted, and Mr. Brown can be reached by telephone or a note through the mail, and the arsenic is not overlooked.

For a long time past I have made a practice of keeping separate records of cement fillings, and sending a notice in six months to have the patient call to have them examined.

During the first three or four years of my practice I found I had lost some patients by having cement wash out in time, and thereby being blamed unjustly and ignorantly by the patient, and through the lack of knowledge on the patient's part to call for examination, or of knowing that cement would not last like amalgam or other permanent filling material.

The cement cards I keep in a card index and place them behind the guide card indicating the month I wish to examine the fillings, for instance, if the filling is inserted in November I place the card back of the May guide or index card. Then in May I send a printed form by mail, calling attention to the fact that the teeth and *that cement* filling should be examined.

....

....

....

INSERTED	CARD SENT	EXAMINED	REFILLED

The printed letter form I use has blank spaces to be filled in with date, name, etc. The following is a sample form, and a local printer can get them out very cheaply in pads of 100:

> ....
>
> As it is some time since I last worked for you, I have taken the liberty of calling your attention to the matter of having your teeth looked over. I would consider it a personal favor to be allowed to examine my fillings to see that they are in good condition and for which no extra charge will be made. You will confer a favor to yourself also, if you will call at my office within a reasonable time to allow me to do this. Respectfully,
>
> .... had cement fillings inserted .... at which time it was advised that ...... call at the expiration of .... months to permit of examining them and to repair them if necessary without further charge, or to refill with amalgam or gold or crown, as the case may be. You will confer a favor to me and yourself by calling at the earliest possible time that we may arrange an appointment. Respectfully,

If others have had the same difficulties in regard to misjudgment by the patient, I shall be well repaid if this article proves helpful to some in our profession.

PRESIDENT'S ADDRESS*

By George H. Copp, D. D. S., Plainwell, Mich.

WE are assembled for our fifty-fourth annual meeting and I consider it a privilege and a pleasure to greet you, one and all, in this progressive city, noted for its beautiful parks, its river on whose banks are so many delightful resorts, its fine hotels, business blocks and manufactories.

Detroit which has the reputation of being the cleanest city in the United States, is a fit meeting place for a society whose aim is the uplifting and progression of a profession so necessary to the public welfare.

I trust you may all find the meeting both profitable and entertaining. The program and clinic committees have spared neither time nor expense in preparing this most excellent and instructive program, and we are to be congratulated upon having such able talent with us.

I hope you will all take advantage of listening to these most valuable papers, and of attending the clinics where we can exchange ideas, and profit by each other's experiences. It is also very important that we should be present for the reports of the various committees.

I do not think it will be necessary to call your attention to the delightful entertainment promised us by our local committee of the First District Society, as we are well acquainted with their generous hospitality. We know that they are ever ready to entertain us, and we also appreciate the fact that it is not only the entertainment which they so lavishly prepare for us which we should be grateful for, but we appreciate the great privilege of attending their annual clinic, which is considered one of the best and most instructive meetings of the country.

The First District Dental Society had two years ago 125 members, today it has 225, having nearly doubled. Let us all work to enlarge our membership. Let us be above petty jealousies and personal grievances and work for the general good of the society. Let the members of each district strive to make their society of enough importance and interest that men who would be a credit to the society will seek admission.

Our State Society has better than doubled since we commenced to reorganize, but there is still a large field which is left unorganized. There is great need of our pressing our organization in districts *already* organized, and of extending it into the northern part of the State. We have taken in nearly 70 members this year. There are between 1,600 and 1,700 registered dentists in the State, and as our membership is about 600, you can readily see what great possibilities are before us.

I feel it is our duty as professional men to take a more active interest in our municipal affairs; we should see to it that such men are nominated as we believe will recognize the recommendations of our State Society, which is certainly better qualified to make appointments than those who know nothing of the profession. Let us be up and doing and make ourselves important factors in the community in which we live; but above all let us be wideawake dentists, attending the State Society meetings and our district meetings, giving to them the best there is in us, and in turn gathering all the new ideas possible.

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*Read before the Michigan State Dental Association, 1910.

We have one new committee this year,—the Legislative committee. It requires considerable time for such a committee to accomplish much; but I feel sure they will be ready to act when the opportunity presents itself,—and we shall expect them to see to it that Michigan has as good, if not better, dental laws than any other state in the union.

I will not make any suggestions or recommendations to this committee, as we will have with us Dr. A. Irwin, of Camden, N. J., who has thoroughly investigated the foreign dental laws, as well as those of the different states, to speak to us on this subject, but I would like to call your attention to the fact that we should ever stand ready to respond when called upon by this committee.

We shall miss at this meeting the presence of one of our members who has been connected with this society as an officer for twenty years. He has had charge of the treasurer's books for several years back, and has done much to keep this organization in good financial standing. He has always taken the keenest interest in all matters pertaining to this society and freely gave to it his time and labor. I have reference to our beloved J. Ward House, who expected to be with us at this meeting, but owing to serious illness and inability to write he sends his greetings to the members through Mrs. House.

We should ever bear in mind that it is our duty to support our dental department at our great university. We all feel proud of our new department building with its modern equipment, and of the very able faculty who has it in charge, and feel that Ann Arbor should turn out the best dentists of the country.

I wish to take this opportunity to express my appreciation and gratitude to the members of the Executive Council, and to the regular and special committees for their able and kindly support during this administration. They have been most loyal, and their work has been faithfully and efficiently performed.

I desire to thank you, the members of this society, for the honor you have conferred upon me, and in taking leave of you I wish to extend to you my heartfelt wishes for your future happiness and prosperity, both individually and as a society.

DO not be too greatly impressed by the talker who uses big words. Not infrequently such words cover the shallowest thinking. The man who really has something to say that is worth saying prefers to speak in language that all may understand.

THE CAST GOLD INLAY*

By C. G. Myers, D. D. S., Cleveland, Ohio

AT a dental meeting, held in Texas several years ago, a dentist, in paying a high compliment to another dentist of some local reputation, said that he could mallet gold better than any man he ever knew. Though I cannot reproduce the word mallet in the southern accent of this dentist, this expression had at the time a very peculiar effect on me and I have remembered it very vividly ever since.

At this time I had been in the practice of dentistry but a short period and my ideals had been barely established. But it occurred to me at the time that if a man's ability to mallet small pieces of gold into a cavity of a tooth, and the necessary endurance to accomplish certain results along these lines constituted a great man in any profession, my ideals would have to be very greatly altered.

My experience, after a number of years in the practice of dentistry, has been that dentistry has meant the carrying out of too many minor and petty details so as to test to the utmost one's nervous and physical powers. We find that the productive life of a dentist is not so great as that of men in other lines of business and professions and this is wholly due to the fact that a dentist is subject to little petty annoyances and details that have been wholly eliminated in other businesses.

When I attended dental college I was taught that the ideal point for condensing cohesive gold was the needle point and that the serrated point was simply an aggregation of needle points. We were taught at that time to use points with deep serrations. We were also taught to use gold in very minute particles. A mallet weighing eight to ten ounces was used in condensing these small particles of gold.

About this time I learned the use of non-cohesive or soft foil. This gold is manipulated with hand pressure and by the wedging process. Some men were very expert in the use of this form of gold and it not only saved teeth successfully, but it was also a great time saver in certain classes of cavities.

After using deeply serrated points for several years those of shallower serrations came into use.

About seventeen or eighteen years ago it occurred to me that if gold had the property of cohesion, this property was not increased by the use of serrated points and I designed and used and continued to use for twelve years a perfectly smooth point for filling teeth with cohesive gold. In fact I used these smooth points for seven years before anyone was found who filled teeth in this same way. It was only after a paper had been prepared on this subject for the Ohio State Dental meeting at Columbus, some years ago, that the discovery was made that the use of smooth points had been advocated by some dentist twenty years before and this was absolutely all that could be found in dental literature on the subject up to that time. At the meeting at which this paper was to be presented there was in attendance Dr. Bowman, of Columbus, and Dr. Heise, of Cincinnati, who were using smooth points exclusively in manipulating cohesive gold, and strange to say, from that time to this I have found no one pursuing this same line of practice.

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*Read before the Northern Ohio Dental Society, 1910.

In filling some inaccessible cavities with the smooth point it was my practice to burnish certain pieces of gold to the mass of filling and this in time became my practice throughout the entire filling.

A double-end amalgam instrument was converted into a burnishing instrument and all my fillings were introduced into the cavity by the burnishing process and without the use of the mallet.

By the use of any of the above methods a great number of details had to be perfectly carried out, for the slightest imperfection in almost any part of the work meant an imperfect whole.

At a meeting of the Northern Ohio Dental Society, held in Cleveland shortly after the discovery of the casting process by Dr. Taggart, Dr. Goslee, of Chicago, read a very interesting paper on this subject and presented some beautiful specimens of work.

The interest of the dentist, not only here, but all over the world, was aroused by this wonderful discovery. To show to what an extent dentists were interested in this process it is only necessary to state that within a very short time, after Dr. Taggart had given this process to the profession, more than three hundred applications for patents on casting appliances were filed in the patent office. Personally, nothing in dentistry ever appealed to me so strongly as did this process of Dr. Taggart's. As it appeared to be the emancipation proclamation, not only to myself but to all dentists, inasmuch as it eliminated detail and filling of tooth cavities. In a crude way this method was adopted in my practice and from that day to this I cannot recall a single instance where I have used gold in filling teeth by any of the older methods. And were I compelled to again resort to the practice of placing gold in cavities as we have been compelled to do in years past, filling teeth would be the last business that would appeal to me.

Modern methods in all lines of business, professions and trades have eliminated detail, but up to the past few years it was not thought possible to apply these modern methods to dentistry, but with the advent of cast gold, as suggested by Dr. Taggart, we have applied the process of elimination to our own profession.

Like all other innovations, cast gold fillings must run the gauntlet of the skeptic and the knocker. About the time that I took up the practice of dentistry, crown and bridge work was just coming into use and how it survived the many knocks it received at that time is more than can be figured out. It was claimed that it was unsanitary, unsightly and that the life of it was very limited. It was only when a dentist found his practice drifting away from him that he began to retract some of the harsh things he had said about it and added it as one of the means of extracting a livelihood from his profession. The same will be true of the cast gold inlay as was true of crown and bridge work. Some few will make a success of it and others will not because it is an apparently easy process.

The process is in its infancy and the appliances are crude as compared to what we will have in the future. Mistakes will be made, but through these mistakes will come ultimate success.

Let us look at some of the features of elimination brought about by this work. If it had nothing to recommend it beyond the fact that the teeth did not need separation, which I know from personal experience is a barbarous practice, it would need nothing more than this to class it as an ideal method of restoring lost contours in teeth. If it has eliminated the rubber dam, this alone would recommend it to the helpless victim whose sufferings in the application of this necessary adjunct to the old methods of filling teeth were only equaled by the tortures of the inquisition.

Who has not suffered from the application of ligatures? Who has not suffered from having a sore tooth malleted upon until every blow seemed worse than the one previous and then the final tortures of the disks, stones and strips in the finishing process until dentist and patient were about as near nervous wrecks as they possibly could be.

No wonder dentistry and the dentist have been avoided. Even the dentist avoids the dentist. You will find in the mouths of dentists as bad a state of affairs existing as you will find in an equal number of patients. But a different state of affairs should exist today, through the methods we have of eliminating the sensation in the tooth and all of the disagreeable features formerly connected with the malleting of fillings in the teeth.

It will be but a short time when the demands of the patient will compel us all to use more humane methods in our work. The physician today who would attempt even minor operations without the use of some anesthetic would be classed as a butcher.

In regard to the technic I will have very little to say. As I said before it is my impression that we have only a slight knowledge of the possibilities of this work and our methods up to the present time are very crude. I feel that Dr. Price with his pressure gauges and heat gauges is on the right track when it comes to getting perfect and uniform results.

Up to the time the cast inlay was introduced, large restorations of the tooth were very frequently made with amalgam or crowning. But it is now possible to save teeth in a way that crowning has to be resorted to only on rare occasions. As attachments for bridges where at one time extensive grinding of tooth structure was necessary or gold was unnecessarily displayed, we can now use gold inlays and gold overlays with pins running into the root canals as attachments for practically all bridges, and the resulting work is not only practical but substantial and beautiful.

For a great many years all-gold crowns made by me were made after the method suggested by Dr. J. Rollo Knapp, of New Orleans. The results obtained by this method were perfect for this class of work, but the number of details to be carried out was enough to discourage almost any beginner in this work. The same results or better results are now obtained through our knowledge of casting and with no more details than was required in the old shell crown. The construction of bridges both gold and porcelain at one time meant a multitude of details in its construction, but now with a few simple fittings a bridge constructed in wax with porcelain facings in place, a bridge of any size can be made in one casting and we have never made such perfect fitting plates as we have made by the casting process.

My method of making inlays consists in making a wax pattern of whatever is to be reproduced, investing this in one of the different investing compounds furnished by the dental supply houses, and using either centrifugal force or the vacuum for forcing the gold into the matrix. In casting directly on porcelain there is no more danger of checking the porcelain than there was by the use of the blow-pipe. It is only necessary that the temperature of the investment and porcelain be raised to the fusing point of the gold.

There are only two ways that the busy dentist can increase the income derived from his practice, one is by increasing the fees and the other by increasing his output of work. It is very hard for a dentist with an established practice in a certain locality to very greatly increase his fees, but it is easily possible for him to more than double the amount of work turned out by using the casting process.

Now, I feel grateful to anyone who will put money in my pocket, and I feel doubly grateful to anyone who will make my business cares lighter. I do not feel that it would be fitting to close this paper without expressing my gratitude to Dr. Taggart for all that the casting process has meant to me in the last few years. If I am to continue in the practice of dentistry I can do so a greater number of years and with greater profits each year than I could possibly have done under former methods. Dr. Taggart is an originator and inventor and whereas he would like some substantial returns as a result of his inventions, for the inventor usually is an erratic individual and not a good business man, he would be more touched and pleased by the generous praise and plaudits of those in his own profession. It is not for me to say whether he is right in obtaining patents and trying to enforce legally what the law says is due him, but I do know that the dentists have made a very poor show of appreciation for the many benefits they have derived from what Dr. Taggart has taught them. Whether casting was known to the Egyptians or Phoenicians cuts no figure in this case. Dr. Taggart taught you what you know about this process and the chances are if it had not been for the energy, the sleepless nights and the outlay of money that Dr. Taggart has put in this work, we all would be plodding along in the same old rut.

DISCUSSION.

Dr. L. E. Custer: Dr. Myers, after reviewing the malleted filling, first says it is quite unnecessary to separate the teeth for an inlay. This is true in all proximal fillings in teeth in normal position. That which was heretofore so hard to do is now one of the easiest parts of the work to produce,—proximal contours in inlays,—and in addition it has been my practice to melt a pin-head sized piece of 22-in. gold upon the contact point of the inlay, thus giving it a nicely curved surface of hard gold. That which was so hard to secure, and at the same time so important to secure, in a malleted filling is now most easily produced in the inlay.

He correctly says that the rubber dam has been eliminated and with it the ligatures and the hours of painful malleting. I would also add that half of the pain of cavity preparation has also been eliminated, for as a rule the preparation of a cavity for an inlay does not require so much cutting in the dentine as for a malleted filling. A large part of the work can be done with the chisel and in the enamel. With the malleted filling the time was when the operations were feats of endurance on the part of the patient and dentist rather than of skill. But what a wonderful change has come about, not only in the humane methods of technique but in the final result. For who can deny that a cemented filling is not a better saver of teeth, a support rather than a strain upon frail walls, a preservative of color and one of less thermal conducting property?

The essayist is too modest in what he says regarding gold crowns. In my own practice the inlay has taken the place of fully 50 per cent. of the gold crowns formerly used. His tribute to Dr. Taggart is timely. Sufficient time has now elapsed to test the merits of the Taggart inlay, as I like to call it, and viewed as a method of practice, I regard it as the most revolutionizing step, all things considered, taken in dentistry in the past decade.

Dr. Henry Barnes, Cleveland: From the secretary I received a communication stating that I have had a large experience in cast gold inlay work, and requesting that I should discuss the paper. As a matter of fact my experience has profited me nothing for I have not succeeded to my satisfaction in this field.

There are those who claim success and I have seen beautiful work by this method. Not succeeding myself I reasoned that the thing for me to do was the thing that I could best do, so if agreeable to you I will briefly outline the method which I am using.

Before outlining the method, I desire to state that the cast method is in no wise condemned except so far as I am personally interested. Several months ago Dr. Alexander, of North Carolina, called upon me and outlined his method of packing moss fiber gold into a cavity, removing some investing and then melting 22k. gold plate into the mass. My cavity preparation was such that most of the gold remained in the cavity when attempting to remove the mass. However, thought was stimulated and a gold matrix was placed within the cavity and this was filled with moss fiber gold (I now use Ney's No. 4 soft gold foil with equal success and a saving of time), the whole removed from the cavity placed on the charcoal block and 22k. gold plate sweated into the mass, using the Lane blow pipe and the mouth as a bellows. A little practice with this method will surprise you in the rapidity with which the work can be performed. Many cases can be made in the time required to make the wax model, and the margins are assured if your technique has been correct. To shape the gold matrix of 3-1000 pure gold, orange or other suitable wood is used, spatulate at one end and rectangled at the other, also another stick is used shaped at one end exactly as your grandmother used to notch her clothes pole; this serves to smooth matrix over the margins. Do not use metallic instruments on matrix except the matrix forming instruments at the cervical margins. Use no flux in sweating gold into fibre.

Question: How do you get occlusion? Answer: Fill matrix to occlusion and at the last use a little flux over occlusal surface, including matrix margin, then sweat 22k. gold plate over same. No flux is used previous to this time.

Question: Do you condense the fiber gold? Answer: Only as much as can be done by the hand with the wood point and to the anatomical form. If you fail to obtain a good cast inlay grind margins, place matrix in cavity, cast in this, remove and sweat 22k. to cast and matrix.

Dr. H. C. Kenyon, Cleveland: From the tenor of Dr. Myer's paper we naturally conclude he is an inlay enthusiast. And while I agree with much he has said I cannot subscribe to all of it.

The first thing I want to take exception to is this:

"In a crude way this method was adopted in my practice and from that day to this I cannot recall a single instance where I have used gold in filling teeth by any of the older methods, and were I compelled to again resort to the practice of placing gold in cavities as we have been compelled to do in years past, filling teeth would be the last business that would appeal to me."

Unless his practice differs much from mine, I could not subscribe to such a statement as that. I do not believe that all the cases requiring fillings can be filled with inlays more easily than with some other kind of filling, especially the malleted gold filling. I believe there are some valuable things to be gained from the malleted gold filling, put in under intelligent present-day methods. I do not think that a statement like this should go unchallenged when we have young students in our audience who are apt to take statements of essayists as authority rather than opinion.

I want to endorse fully what he says in regard to the use of the inlay in the place of the crown. I do not believe the inlay comes to replace the malleted gold filling so much as it does some other operations. I scarcely use the gold crown at all now except in cases of bridge work, where I think an inlay may not be of sufficient strength to carry its portion of the stress. In such cases I still use the gold crown because I can get stronger support. The essayist has called attention to some very important points which ought to change the minds of those who are opposed to the gold inlay, and the cast inlay in particular. One is the question of separation of teeth and the elimination of the rubber dam. I cannot conceive of a sensible operator putting a large gold filling in a tooth that is subject to pyorrhoea, and I cannot conceive of a humane man putting a malleted filling in the mouth of a very sensitive, nervous woman whose health is so poor that she cannot sit through such an operation without a case of nervous exhaustion. And I think the doctor is timely in calling attention to the fact that we are practicing humane dentistry as far as we know how. I think we ought to emphasize these methods, and that is one of the strong arguments in favor of the inlay method of filling teeth. There is much that might be said as to whether we should use the gold inlay or the malleted filling. A man might better make a gold inlay than a poor filling. If he is going to leave the cracks there at all it is better to have the cement in them than not.

Dr. J. V. Conzett, Dubuque, Ia.: I am diametrically opposed to some of the things that have been said, and I very much deplore the fact that any man will get up before a society of scientific men and say that he would not use a malleted filling in any place, because the inlay is a new process and the gold filling is as old as dentistry itself. We know what the gold filling will do, we have great hopes of what the inlay will accomplish, but I believe the man is very short-sighted who will cast aside the gold filling. Things have come and things have gone which were going to take the place of the gold filling, and from time to time men have advised us to throw away our pluggers; but the men who have done so have afterward been found sneaking around in the ash pile hunting for them. I want to condemn just as severely as it is possible to condemn, any man who will advocate the placing of inlays to the exclusion of gold fillings.

We deplore excessive extension for prevention. I advocate extension for prevention, but it should not be abused. You and I have no business to cut away tissue that can be saved. It may be that there are some men who ought to use cast gold inlays in every place, because they haven't the ability to acquire the technique to make gold fill ings. I do not believe Dr. Myers is that kind of a man because I know of the success he has had with gold foil.

I want you to understand that I am not condemning the gold inlay. I said in my paper that it had come to stay and I believe that it is going to have increasingly larger used in restoring lost tooth tissue. But I do believe that the man who is going to be a good operative dentist should be able to use any material. It is a question of judgment; it is a question of technique; study the conditions and then employ the method which will best meet the conditions and restore the tissue to the best usefulness.

The doctor speaks of extracting a larger fee from our patients. I am glad I do not have to go out and rope them in. They come in. I do not believe that the men who are practicing dentistry as it should be practiced in these modern days have to go out after patients. I do not believe that the patients come to us with fear and trembling. Just in the last week I had a lady come to me who had some most abominable fillings in her teeth. If you had seen them you would have thought that the dentist had used no cavity preparation whatever. She came to me in fear because of the experience she had had. That lady was at lunch with my wife and she said it was a positive pleasure to have her teeth filled in my office. I simply mean by that that because of our modern cavity preparation and the modern methods of using instruments, it is not necessary to inflict the pain that was necessary years ago. I should hate to be a dentist who would have to consume three or four hours in making a malleted filling. I believe I would quit dentistry. I do believe when statements of this kind are made before scientific bodies that we should get the other side. I believe that if we were to wipe out the necessity for making the gold filling,—that if the other methods were to take the place of the gold filling—it would yet be best for us to practice the methods of the technique of the gold filling in our schools for the perfecting of our pupils, because there is nothing that will so stimulate a student as the making and perfecting of one's self in the filling of teeth with gold foil.

SOME "DON'TS" IN THE ANESTHETIZATION AND REMOVAL OF THE DENTAL PULP

By R. M. Weber, Kansas City, Mo.

1. "Don't" remove pulp by anesthetization without first applying the rubber dam, for "isolation's" sake.

2. "Don't" use anesthetizing agent without a thorough removal of all caries, for "absorption's" sake.

3. "Don't" use anesthetizing agent until cavity is thoroughly disinfected, for "asepsis' " sake.

4. "Don't" prolong pressure until the surrounding tissue is so infiltrated with the solution that recovery is not prompt, for "pericementitis' " sake.

5. "Don't" enlarge pulp chamber or canal opening with non-sterile burr, for "cleanliness' " sake.

6. "Don't" use broach that has not been previously sterilized or disinfected, for "Hec's" sake.

7. "Don't" use broach without testing, for the "tooth's" sake.

8. "Don't" wrap cotton on broach with bacteria laden fingers, if only for "goodness' " sake.

9. "Don't" use "peroxide" to check hemorrhage or cleanse canal, for "color's" sake.

10. "Don't" fill immediately, but seal in an anodyne agent and fill at a subsequent sitting, for "thoroughness' " sake.

THE PREVENTION AND TREATMENT OF ROOT CANAL INFECTIONS AND ASSOCIATED LESIONS*

By Don M. Graham, M. D., D. D. S., Detroit, Mich.

(Continued from page 78 February Summary)

DISCUSSION.

DR. CHALMERS J. LYONS, Jackson, Mich.: The scope of dental therapy covered by the lecture is so great that in attempting to discuss it, it is hard to know just where to begin. I wish to congratulate Dr. Graham on his most excellent address and I wish the important facts contained therein might be impressed on every operator's mind, for then dental therapeutics would be on that same level that mechanical and operative dentistry are today.

With the advancement made in other lines of dentistry today, do we stop and think if we have made the same great strides in the treatment of the lesions of the mouth, or have we been so occupied with inserting gold and porcelain inlays and making cast crowns and bridges that we may have not stopped to consider fully the all important points of preventing and treating dental lesions that the essayist has so beautifully and thoroughly illustrated.

I believe that this is a timely subject and one that deserves a more than passing notice. The essayist has so completely covered the ground and there are so few points that I can take exception to, that I feel that I cannot add much to the weight of the subject in hand.

The first point he makes in his address is the necessity of frequent visits of our patients. The prophylactic specialists have little trouble, I believe, in convincing their patients of the necessity of making frequent visits to their offices in order to keep the mouth and teeth in the best possible condition, and I know that in those patients who see their dentist not once in two or three years as the majority of our patients do, but several times a year, root canal infection and associated lesions are a rarity. I believe it is our moral duty to educate all of our patients to visit us frequently that the first evidence of these pathological conditions may be detected.

The essayist states that in our examinations all evidence of thermal stimulation should be inquired into as well as all abnormal sensations that early treatment may be instituted.

I will just add to this that reflex pain in the trifacial nerve must not be overlooked, for the seat of trouble may be in one part of this nerve and the pain in another and that a methodical anatomical examination should be made by first examining all the teeth on the painful side; examine the gums and alveolar process on the painful side and then examine the antrum of that side; also the teeth, gums and alveolar process of opposite side as well as the opposite jaw.

The mucous membrane of the lips, Steno's duct, tongue, temporo-mandibular articulation, hard and soft palate, parotid gland should all be examined for a possible seat of irritation to this nerve before completing a diagnosis of the case.

I quite agree with the essayist in the devitalization of the teeth that have to withstand unusual stress in carrying a bridge. By so doing we are accomplishing a twofold purpose. First, the undue stress will many times injure the pulp so that it will die and future trouble will develop. And, second, in the bell-shaped teeth it is an absolute impossibility to properly prepare the abutment for the reception of the crown when the pulp is in its normal state, and a resultant ledge is left between the crown and abutment where food deposits can, and will accumulate and subsequently peridental inflammation ensues. I believe that in ninety per cent. of cases the pulp should be devitalized if we are to do preventive work in bridge work. In the cementation of dowels much care must be exercised to prevent air spaces and subsequent infection.

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*Read before the Michigan State Dental Association, 1910.

The essayist states that with the canal somewhat moist a cement of proper consistency can be painted on the walls and forced to every part of it.

Now, if I were going to moisten the canals with water I should expect to use a hydraulic cement in cementing the dowel to place, for in those cements it is necessary to have some moisture for perfect crystallization. Then the canals should be only moistened and not flooded with water.

In using other cements than the hydraulic I have found a good practice just previous to mixing the cement, to take the liquid of the cement and incorporate a small quantity of the powder and moisten the canal with that, then mixing the cement to the proper consistency and the cement can then be readily forced to every surface of the canal and all air spaces eradicated.

In the devitalization and treatment of pulps I believe a mistake is frequently made by not having sufficient working space before beginning the operation. Many of these constricted and tortuous canals are very difficult to follow and cleanse thoroughly, even when the tooth substance has been cut away sufficiently that the entrance to the canal may be seen, and to do thorough work this should always be done. I believe by the aid of H_2SO_4, patience and the knowledge that you will be sufficiently remunerated for the time and effort expended, that these canals can all be opened without the aid of any form of engine reamer. In fact, I have always believed that a canal that is so small that it cannot be opened up by the method just named is too small to ever give any future trouble, and I would rather take my chances on future trouble than I would on perforating the root or breaking of a reamer.

I believe the short cut methods of treating root canals have worked a great injury to this branch of dentistry. Many dentists are located in places where they think they cannot get a sufficient remuneration for this work to do it as it should be done and they resort to slip-shod methods as a means of satisfying the patient and perhaps their own conscience, and I believe the use of mummifying paste of any kind is unscientific, as well as unprofessional.

When we have well known remedies the physiological effect and therapeutic action of which are known and methods of using them so well and thoroughly advocated today by scientific men, there seems to be absolutely no excuse for not placing the treating of root canals and associated lesions on a purely scientific basis and by so doing the proper remuneration will be forthcoming.

The essayist has thoroughly covered the subject of mummifying paste, medicated powders, etc., and I heartily concur in all that he has said. I believe, with the essayist, that root canals can be better filled with gutta percha dissolved in chloroform and using the gutta percha canal points, preceding the operation by moistening the canal with eucalyptol after it has been thoroughly desiccated, than by any other method.

In the treatment of putrescent pulps with formo cresol great care must be exercised that none of the medicament is by any means forced through the apical end of the root.

This medicament should always be sealed into the pulp chamber with cement. Sandarac varnish and cotton or temporary stopping has no place in connection with the use of this remedy as a covering or cap to secure the medicament in the pulp chamber.

As a counter irritant in these abscessed conditions I like the use of phenol iodide.

When there is an abscessed condition which will not respond to treatment through the root canal and by the application of counter irritants, and I might say these cases are comparatively rare, root amputation may be resorted to, but a skiagraph should always be taken first that the positive seat and extent of trouble may be ascertained.

Then, as the essayist says, they should be cut off even with normal and healthy tissue. The simple snipping off of the end of the root is not sufficient. I believe this should usually be done under a general anesthetic if possible, that a thorough treatment of the same may be accomplished. My experience with perforated root canals has not been very satisfactory, although I have never used amalgam as Dr. Graham has outlined. I have used gutta percha but found it more or less irritating.

In diagnosing many of the pathological conditions associated with the tooth pulp the radiograph is invaluable, and I believe the day is not far distant when all well equipped dental offices will have one of these equipments or at least the office will be accessible to one. By this means, as has been shown today, the extent of diseased area, and many times the cause, is distinctly pointed out. If the technic of taking care of many of these pathological conditions is worked out as finely and thoroughly as the crown, bridge or inlay which is expected to be used in connection with the diseased tooth or roots, then will all of our operations be a success, but until then, many of our fine crowns, bridges and inlays will be like some of the operations of the general surgeon, which are successful, but the patients die.

Dr. F. W. MacDonald, Detroit: I feel that there is no subject of such tremendous importance to the general practitioner in dentistry as the one we have just heard discussed. Those of us who know of Dr. Graham's work, realize that he is simply telling us of work he is doing every day, so that we need not treat his paper as if it were coming from a theorist, but from one who is practicing every method he has advanced.

We are just beginning to realize the significance of good root canal treatment. We are beginning to understand that our failure to properly treat and fill root canals may very often lead to disastrous results to mind and body. In the face of this understanding, how can we with impunity, continue to treat our patients in the haphazard manner we have been so often guilty of in the past?

Why is it we have been neglecting such a very important part of our practice? Is it because we do not know how to properly open and cleanse root canals, or is it because we cannot get the fee we think would be proper remuneration for such arduous work? There is no doubt that the first cause is that we have developed a habit of carelessness or lack of thoroughness, the beginning of which many of us can trace back to our early days in the dental school clinic.

Then the fact that we cannot ask for proper remuneration enters into the question. There is no doubt that there is no operation in dentistry that requires more painstaking effort, and that is so exhausting as root canal work; and also there is no doubt in my mind, that there is no operation for which the average dentist gets such a small fee. The essayist says that we must get a fee, to properly remunerate us for the time spent, but he does not tell us how we are to get it. The fact of the matter is, we can only get what our patients will stand for paying, and they will stand for paying only in proportion to the value they place upon their teeth. Some value their teeth, others do not, and all we can do is to educate our patients up to our ideas as to what the value of a tooth is; when we have done that, then we may be able to charge for the time spent.

As a general rule, to do good work we must forget for the present, the money value of our services and do it largely for our self-satisfaction, and for its health value to the patient; after that we must endeavor to get as near to the value of our services as the patient, in our judgment, will stand.

I do not decry the use of root canal pastes. In some cases they are valuable; but I do not believe that the dentist is using the best root canal filler in these cases where he knows he has access to the apices of the roots, when he does not use gutta percha as outlined by the essayist. In these cases where root canals are not accessible their full length, I believe pastes are very valuable.

In chronic abscesses I think it is wise to use a probe at the first examination to discover the amount of broken down tissue. Much time may be saved by so doing, for if there has been much destruction one could not expect to get any permanent results from medical treatment alone. Of course in these cases surgical measures such as outlined by the essayist is the rational treatment.

Dr. C. H. Oakman, Detroit: Twenty years ago we all had more or less trouble with the use of cocain. Why, we knew nothing of the drug. When I was a student we were almost afraid to use it in the institution. For the last sixteen years I have had no trouble with the use of cocain. When you get a scientific preparation of cocain you are all right with the solution. If you have not a scientific preparation you can expect danger.

Dr. Lyons spoke about devitalization of the pulp and crowning teeth and abutments for bridges. He said in 90% of the cases, I believe, it was the thing to do. I would like to go him one better and make it 99%. It is my experience that it is the right thing; you get a better adapted crown and ward off tenderness at gum margin and the eventual death of the pulp.

I cannot help advising the use of the skiagraph in all cases of doubt as to the area of extension of caries and necrosis of the bone. I want to say further, if you are in any place where you cannot have a skiagraph taken, use a hypodermic of cocain or something similar, go in with a pointed steel probe and explore the area and you will find that you can press into the antrum if the bone is sufficiently diseased, and at the same time you can pretty nearly tell the necrotic area by making several punctures.

Dentists, as a rule, do not realize how many cases of antrum disease there are. I know one old gentleman who has had 40 years' experience, and he said he had never seen an antral case—a dear old gentleman practicing dentistry in this city. The fact is he has undoubtedly seen hundreds, but failed to recognize them. Seven antral cases came into my office in three days recently. When your patients have swellings in and about the antrum do not say it is just a little swelling and will go away in a few days; it needs immediate attention. I want to relate a special case. It was just three weeks ago. A young woman, 24 years of age, a school teacher, developed a swelling. Had trouble that way two years ago. Dentist said it was all right, it would go away. The pulps had been previously taken out of three teeth and he did not think there was anything to it. She said, "I have been advised to come and have an inspection made and see if operation will not reduce the swelling." The dentist said, "No, do not go to anybody who does surgery, because they are too anxious to cut in." The poor girl has gone until now the condition has become malignant. After operating on the jaw and amputating the roots of the molars and bicuspids, and after performing a radical operation on the antrum and curetting same I felt that I had done all that was possible. At this time I was not certain that the condition was malignant, although from the protrusion of the eye and the history of the case I was suspicious of something more than ordinary antral affection. I had the tissue examined and found it to be a carcinoma. The prognosis is that she will probably live nine months. Had that case been operated upon two years ago there would have been a chance to save her life. This goes to show that we cannot treat swellings in any part of the body with impunity, for we never know when these chronic affairs become malignant. In regard to neoplasms I would state that in the past five weeks I have seen ten cases, only two of which were operable; this, I think, would put the dentist on his guard to give the patient the benefit of an early operation, which we know is the only salvation.

In dressing wounds about the jaw ordinarily it is best to pack them tight for a few days and at each dressing thereafter lessen the amount of packing.

For neuralgia, examine the upper third molars and you will frequently find them the primary cause of pain.

In cutting into the jaw a few things ought to be remembered. Be reasonably sure what you are going for. Dentists have by mistake cut into the hard palate for the purpose of removing what appeared to be necrotic bone; instead it was of specific origin and should not have been treated surgically at all, but the patient should be referred to a physician and given anti-syphilitic treatment.

Dr. Don M. Graham (closing discussion): First, regarding the use of phenol, which was criticized somewhat severely by Dr. MacDonald, I will say that I have not had any deleterious effect from its use. Of course all drugs must be used with considerable care. I have used silver nitrate, in fact, nearly all the escharotics, in cases where I want to stimulate granulation, and my experience is that phenol is the best drug we have for such cases.

Packing, I think, is most important. He also criticised that rather severely, but I think you will admit that the worst possible patient you can have is a dentist; possibly the next worst is a physician, and while I am fortunate enough to have a good many of them, I sometimes wish I did not have so many. I think it is really important that the cavity should be kept well open, and I always like to feel that it is so thoroughly open that I can actually see granulations and repair taking place. In this way tissue loss is best restored, granulation cavities are prevented which, if permitted, might become reinfected and thus spoil all your labors.

One of the slides that was just shown was of an immense necrosis, extending between first bicuspid and second molar, and one of our younger dentists had the after treatment of that case in charge. The necrosis was removed very thoroughly, and he was instructed to pack into cavity very carefully. It was a charity patient, as so many of these cases are, and he packed for a short time, and allowed the area to heal over, whereas if packing had been continued for some length of time he would have stimulated granulation so that the cavity would have filled in almost completely. However, the result today is, on account of indifferent treatment in that respect, that we have a considerable cavity, although tissues are perfectly healthy.

I really have very few words to say in conclusion, since so little has been said by way of adverse criticism. I might say something regarding cocain. I have not discarded its use by any means, but I am using with considerable satisfaction the double salt of quinine and, while possibly more painful, it is certainly more safe. There may be a few who are bold enough to say there is no danger with cocain, but I think you will all admit that there is no monopoly of scientific(?) preparations, and those who have used such have at some time undoubtedly seen some evidence of its toxic effect. I have in mind cases where I have been called in to help some unfortunate dentist with cases of cocain poisoning, and almost every physician has had the same experience in dental cases. I think it is safe to say that cocain is not entirely without danger, that quinine and urea-hydrochlorate is much safer, and it is for this reason that I am using the latter as an anesthetic about the fifth nerve.

I think Dr. MacDonald could have been more unkind than he was and could have said that his face had swollen up quite a good deal, as indeed, in nearly all these cases you will have swelling, for it is impossible to remove necrotic tissue without infecting surrounding healthy tissue, but this inflammation will subside very quickly and there is seldom any pain attending it. I think he will also admit that the injection was painless, as was also the operation, and the most he can say is that the iodoform was unpleasant to himself and some of his lady friends.

Dr. Oakman said something about skiagraphs. It is difficult to get skiagraphs of the antrum that give any very positive and valuable information, but you will recall that skiagraph that I showed where the molar was infected, with a pus area right in contact with the antrum. Its information was positive, and it confirmed the rhinologist's suspicions that it was an infected tooth that caused the empyema. It is not clear-cut always, it is confirmatory often, and it is only in the immediate vicinity of the teeth, where you have different densities, that you get very definite and accurate information from the skiagraph about these lesions. As the great majority of acute antral infections, as well as antral polypi, are not of dental origin, their discussion at this time would be irrelevant. I can only say to the last speaker that in antral infections of dental origin the X-Ray is of inestimable value as condition of root canals, as well as para-dental and para-antral necroses, are often very plainly mapped out on the skiagraph.

CORRESPONDENCE

SUGGESTIONS

By A. P. Kilbourne, D. D. S., Stewartstown, Pa.

In the January SUMMARY I note an article by Dr. F. L. Olds, "How to Obtain a Smooth and Dense Surface on Casts," in which he advocates the coating of the impression with shellac varnish and after that has dried (30 min.) apply sandarac varnish, which should dry twenty minutes, then soak impression before pouring model. Time consumed approximately fifty minutes.

I find that by coating the impression with a saturated solution of paraffin dissolved in gasoline (first staining the impression by means of aqueous solution of carmine, or marking with indelible pencil while plaster is still moist) I can accomplish the same result in about three minutes, for the impression will be ready for pouring as soon as the plaster can be mixed after the paraffin solution is applied, and it will be unnecessary for the impression to be soaked, for, soak as much as you will, no air bubbles will escape from it, and a good model is secured. Another point in favor of the paraffin solution is that the coating is so thin that there is no possible chance of any disparity between size of impression and model, as there might be should the varnishes used happen to be a little too thick, and the annoyance of having the caps on the bottles forever stuck fast just as one wants to use the contents of the bottle in a hurry, is overcome.

The ease with which the impression and model may be separated may be illustrated by the fact that I have so loosened model from impression while tapping handle of impression tray to loosen it from impression, that model could be separated by slight movement with the hands. This has happened with cases where all teeth were present in mouth, and impression had been taken for correcting irregularities.

In the same number of THE SUMMARY is Dr. Lester's article on "Restoration of Badly Broken Down Roots With Acolite." The doctor tells us how to do when pins can be placed parallel in the roots to be restored, but I find that such cannot always be accomplished, especially if the tooth has been so long decayed that the roots are now separated. In such a case prepare root and insert pin through disk of 36 gold, burnishing to place on root and strengthen with solder, making separate cap and pin for each root, and bending the portion of pin left above cap to be parallel with the others, cutting partly through with saw if necessary to bend the more easily, then soldering again. With pins in position on roots secure a model of restoration desired in inlay wax, invest, cast and set as one does a Davis crown. The holes left by pins may need slightly enlarging before restoration will go to place, as the force of the metal in casting will cause the investment at that point to slightly crumble. A narrow metal band approximately the size and shape of cast desired may be used while taking the impression in the wax to prevent the spreading of wax at the gum margin when the patient bites on it.

ANOTHER PHASE OF THE FEE PROBLEM

By D. W. Barker, D. D. S., Brooklyn, N. Y.

Editor of The Dental Summary.

Dear Sir—I have read numerous articles in THE SUMMARY recently, the authors of which seem to think the average dentist don't get all that is coming to him. However that may be—and I believe it is true—there are a goodly number who are getting more than is due them by methods that are nothing short of downright dishonesty, and I can prove it.

Case 1.—A gentleman came to me recently for whom I put in three small fillings. He was very much surprised that there was no more required. Not long before he had a toothache and went to Dr. — ——, who was recommended by a friend. Dr. — — — looked at the tooth and sent him to a gas man to have it extracted. Not wishing to lose any more teeth he returned to the doctor for consultation. Dr. ——— examined his teeth and told him the work would cost $45. The patient was obliged to defer so extensive a job and asked how much he owed. Dr. ——— replied $5.00, which he paid —and did not return. The only way such an amount could be run up would be to tear out perfectly good fillings and refill. Granting that he was entitled to some fee for his examination, still the $5.00 was extortionate. Perhaps my ideas of ethics are a bit old-fashioned, but in my opinion this doctor was, in both the proposed work and in the matter of the $5.00 fee, as dishonest as though he picked the man's pocket. And yet he is an esteemed member of my own Dental Society (2nd district) and supposed to be an honorable man.

Case 2.—A lady patient of mine living in Manhattan and being in a hurry went to a nearby dentist. He kept her coming several times and finally charged her $15.00 for an ordinary small amalgam filling. No treatment of the tooth was needed or given; no other work done. I saw the filling afterward and $2 would have been a fair charge. Again the doctor is *an honorable man* and I believe a member of the 1st district society.

It is amusing to see how some pyorrhoea specialists (so-called) work their hobby to death just now. Every thing that gets into their net is fish whether it swims or not. In my younger days I read a story by Charles Read in which the heroine gets sick. She is taken to a specialist whose particular hobby is the lungs. He examines her and decides her lungs to be in bad shape and prescribes accordingly: no better. She is then taken to another specialist whose hobby is the heart. He finds something out of kilter with her heart: no better. She is then taken to a specialist whose hobby is the liver and he promptly finds serious trouble with that organ: still no better. All were wrong—she was in love.

Case 3. An orthodontist told me not long ago that he had just cured a patient of pyorrhoea by correcting the articulation. "No other treatment?" I asked. "Oh, well, of course, I cleaned her teeth," he said. "How old was she?" I asked. "Seventeen." "Patients seventeen years old don't have pyorrhoea and you ought to know it," I said. "Well, anyway, her gums were very much inflamed," he said. Query—doesn't that man know pyorrhoea when he sees it or is he fooling his patient? He also is an ethical man and formerly an officer of my society.

Case 4.—A lady whose teeth I examined in June returned from her summer vacation very much alarmed because an eminent practitioner had told her that her teeth were in a dreadful state from pyorrhoea. I asked her to point it out but she failed to find it. There was not a particle of pyorrhoea in that woman's mouth. There was, however, a dying pulp which the dentist failed to diagnose.

Case 5.—Another very eminent specialist, a former officer of one of our district societies, is at the present time treating a man seventy years of age for pyorrhoea whose teeth are so loose that some of them have been removed with the fingers, *and promising to cure him!* Are these the sort of "cures" that are reported by the specialists? It looks very much like it. Are they not overplaying their hand a bit? and do not such things justify our skepticism and derision?

Note, if you please, that the men who do these things are not dental parlor quacks from whom such things are to be expected, but eminently respectable men and members of ethical societies. It is queer how my patients get stung when they get into the hands of other dentists. I don't like to think my esteemed fellow dentists are liars and thieves; maybe they are only what Brother Bill calls "taking a comprehensive view of the situation." With that optimistic euphemism we will let it pass and ask in conclusion, are we not, in our greed for dollars, lowering our ethical standards and losing sight of the homelier virtues of simple honesty and truthfulness? Are we not imperiling the confidence which the public reposes in our profession and losing our own moral fiber and degenerating into a profession of mere quacks? That action and reaction are equal in opposite directions is as true in ethics as in physics. It is not for nothing that we barter honor for dollars. Depend upon it we shall certainly have to pay the price.

> *As in all other work, the chief factor in success is the power of sticking to one thing. I attribute all that I have accomplished to the fact that I hold on where most persons get discouraged.*
>
> *—Thomas A. Edison.*

EDITORIAL

THE THIRD SET OF TEETH

WE frequently read in the public prints an account of somebody "cutting a third set of teeth," and some months ago one of the leading physical culture magazines enlightened its readers on the subject, "Can We Grow a New Set of Teeth?" Part of the discussion in this magazine was as follows:

> "When our permanent teeth come, we are young and the circulation is at high tide, but when we have advanced in years to that point where those teeth begin to wear out, the circulation has begun to decline and its power to produce another tooth or set of teeth is gone, just as the scalp wherein the circulation has declined until it is unable to grow more hair.
>
> "I believe that the circulation can be accelerated in the jaws sufficiently to grow a third set of teeth, or that the process can be continued indefinitely. My plan is to apply the hand to the external portion of the jaws. This can be done when we retire at night. When sleeping on either side keep the hand between the pillow and the jaws the palm toward the face.
>
> "We have often read of instances where persons in advanced life have grown a new set of teeth and it is possible that such persons had unconsciously formed such a habit."

The worst of it is that people believe such nonsense when it appears in a magazine, and also reports appearing in the newspapers such as the following, which has recently been going the rounds of the press:

> "Columbus, O., Jan. 14.—Judged by the masculine standard that a man is as old as he feels, William Clark, a court house attache, is a very young man. Every day, as a third set of teeth which he is growing, comes nearer being nut-cracking realities, Clark grows younger. He is now 89. The new teeth promise to become terrors to tough pieces of beefsteak. Surgeons and specialists say he is one man in a million to be favored by nature in this way.
>
> "Like the teeth that came in his childhood, Clark's third teeth are slow in growing, and their coming has been marked by some of the symptoms that attend 'teething' in childhood. But unlike the growth of teeth in children, the 'back ones' are growing first. This has added another feature over which students of anatomy have puzzled.
>
> "Clark is the proudest man in all Ohio. He has full confidence in his ability to live long enough to give the new teeth a chance to exercise their power on beef trust products, etc."

There being no case on record that, so far as we are aware, is authentic, it was thought best to investigate this one. Accordingly a member of the Columbus dental society interviewed Mr. Clark and this is what he found: A point of a tooth in the upper right molar region which was the only indication of teeth in either of the jaws and the man would not permit the dentist to examine this to determine whether it was a root, a belated third molar, or really a "new tooth," and would not consent to having an X-ray taken.

There were no other indications of teeth. There was, however, something of a fullness in the incisor and cuspid region, such as we sometimes see in mouths where the teeth have been long lost. This, in brief, is the sum and substance of Mr. Clark's "third set of teeth," and it is but a repetition of the findings of others who in the past have investigated these cases of reported third dentition.

It is true we have many instances of supernumerary teeth and odontomes, but nature has never endowed man with tooth buds in sufficient number for him to "grow a third set of teeth," and this feat will never be accomplished until some scientist discovers a means of artificial implantation of tooth germs in the jaws and their subsequent growth to supply the missing members.

So when you read such articles you can rest assured that there is little truth in them, or, if the subject really has a third set of teeth, the teeth are made of porcelain.

ESSENTIALS IN BUSINESS

RECENTLY a representative from a school of salesmanship in an address before an association of merchants, said:

"Back of everything you sell is your character, and when your community believes that, you will find your customer, gentlemen, and you will keep him."

"The best advertisement of your business is yourself."

"The only way you can get the confidence of a customer is by treating him absolutely square."

The speaker laid down four essentials of good business, "honesty and truthfulness of statement, pertinency, timeliness and persistency."

How applicable all of this is to the dentist. One of the greatest essentials is a good character. A man whose character is above reproach will command the greatest respect from his patients. And the dentist who is strictly honest with his patients, and in his operations, striving every time to give value received will be well thought of.

A pleased patient is sure to speak well of you to others.

Promptness in keeping your appointments in and out of your office is one of the principles of good business that should not be overlooked by the dentist.

Do as you agree to do—Integrity is a most desirable quality in any man. Be careful what you say about others. If you have nothing good to say, say nothing.

Be known, like Abou Ben Adhem, as one "that loves his fellow men."

SOCIETY·ANNOUNCEMENTS

Indiana State Dental Association

The fifty-third annual meeting of the Indiana State Dental Association will be held at Indianapolis, May 16, 17, 18, 1911, at the Claypool Hotel. Plans are being perfected for a great meeting. C. D. Lucas, Pres., Indianapolis, Ind. Otto U. King, Secy., Huntington, Ind.

New Jersey State Dental Society

The forty-first annual meeting of the New Jersey State Dental Society will convene at Asbury Park, N. J., in the "Casino" on the 19th, 20th and 21st of July, 1911, beginning on Wednesday at 10 a. m. Papers and clinics by the most eminent men of the profession. Charles A. Meeker, D. D. S., Secretary.

Susquehanna Dental Association of Pennsylvania

The forty-eighth annual meeting of the Susquehanna Dental Association of Pennsylvania will be held at the Water Gap House, Delaware Water Gap, Pa., Tuesday, Wednesday and Thursday, May 23, 24, 25, 1911

Connecticut State Dental Association

The forty-seventh annual meeting of the Connecticut Dental Association will be held at Hartford, April 18th and 19th, 1911. It is intended that this shall be the largest and best meeting ever held by this society. A concerted effort is being made to increase the membership. A cordial invitation is extended to the members of the profession to attend. Dr. E. J. Abbott, Waterbury, Sec.

Union Meeting of Main, Vermont and New Hampshire Dental Societies

The State Dental Societies of Maine, Vermont and New Hampshire will meet in joint convention at the Fabyan House, Fabyan, New Hampshire, June 27th to 30th, inclusive, 1911. This meeting, to be held amid the beauty and grandeur of the White Mountains, promises to be a delightful one, providing a diversity of entertainment for the visitors, a large number of helpful clinics and an unusual display of instructive exhibits. Harry F. Hamilton, Sec., Newport, Vermont.

Odontological Society of Western Pennsylvania

The thirtieth annual meeting of the Odontological Society of Western Pennsylvania will be held at Pittsburg, Pa., Tuesday and Wednesday, April 11th and 12th, 1911, at which time officers for the ensuing year will be elected. A good program is promised. Come and bring your friends. King S. Perry, Secretary.

Illinois State Dental Society

The forty-seventh annual meeting of the Illinois State Dental Society will be held at Peoria, May 9, 10, 11, 12, 1911. J. P. Luthringer, Chairman Local Arrangements Committee, Peoria. J. F. F. Waltz, Secy., Decatur.

A reunion and clinic of all graduates will be held under the auspices of the Washington University Dental School, April 10th and 11th, at the college building, 29th and Locust streets. An unusually interesting program is in preparation and the meeting promises to be the best in the history of the school. All graduates should mark the dates in their appointment books and make special effort to attend. They will be well repaid for the time spent. All ethical dentists are invited. Robert A. Harris. E. A. Woelk, W. H. Scott, Publicity Committee.

Meeting of the Texas State Dental Association.

The thirty-first annual meeting of the Texas State Dental Association will be held in San Antonio, May 11, 12 and 13. A cordial invitation is extended all ethical members of the profession. J. G. Fife, Secretary, Dallas, Texas.

Semi-Annual Meeting of the New Jersey Board of Registration and Examination in Dentistry.

The New Jersey State Board of Registration and Examination in Dentistry will hold its semi-annual meeting in the Assembly Chamber of the State House, Trenton, N. J., June 26th, 27th, 28th, 1911, for examining candidates for the practice of dentistry. All applications must be in the hands of the secretary 10 days prior to the examination. For information address Charles A. Meeker, D. D. S., Secretary, 29 Fulton Street, Newark, N. J.

NEWS and OPINIONS

RESULTS

Under this head we shall print from time to time reports of the establishment of dental inspection in public schools, free dental clinics and other news from the field of dental education as the work goes on. We shall thank our readers if they will keep us fully advised of all developments in their locality.

FREE DENTAL INFIRMARY

John H. and Thomas A. Forsyth to Create Memorial for Their Brothers

Boston, Feb. 19.—Announcement was made tonight by John H. Forsyth and Thomas A. Forsyth, wealthy business men of this city, that they will begin immediately the erection in the Fenway of an institution to be known as the Forsyth Dental Infirmary for Children as a memorial to their brothers, James Bennett and George Hamilton Forsyth. At the infirmary the teeth of poor children will be treated free of charge.

Besides providing the land and erecting the building the Forsyths will provide a maintenance fund of $1,000,000. Several years ago the idea of establishing such an infirmary occurred to James H. Forsyth and in his will which proved invalid, he had a clause leaving $500,000 for the purpose.

After his death the two surviving brothers decided to carry out the project and have been formulating plans ever since. Last year the project was incorporated, the incorporators being Thomas Alexander Forsyth, Frederick W. Hamilton, president of Tufts College; Edward W. Branigan, Harold Williams, John F. Dowsley, Sumner Robinson, Ervin A. Johnson, Chester B. Humphrey and Dr. Timothy Leary. These will act as trustees.

The infirmary will be one block from Bryant street and Huntington avenue, near the Art Museum. The land nearest Massachusetts avenue will be converted into an enclosed park and will be known as Forsyth Park.

Good Work In New York

After two conferences between Dr. W. A. White, Wr. W. A. Howe and Dr. Herbert L. Wheeler, it has been decided that the first work of the Dental Consultants and Lecturers of the New York State Board of Health will be to secure the necessary equipment for illustrated lectures. These lectures to be given, as are others, authorized by the State Board of Health, to further the work of educating the public to maintain a more hygienic condition of the mouth and teeth. The lectures being a part of a series which are authorized by the State Board of Health on the question of general hygiene. For the present, town and city authorities, boards of health, boards of education and so forth, in the state of New York, who wish it, will be able to obtain the services of Dr. White and Dr. Wheeler as lecturers on the subject of mouth hygiene.

As the work expands and as funds are appropriated by the state it is hoped that the work of the present consultants and lecturers will be given over entirely to organization and that many more dentists may be eventually put in the field to carry on the educational work throughout the State of New York and to advise and assist health and school authorities and dental organizations in the necessary work of establishing clinics for attending to the practical part of dental troubles. Hospital, health and educational authorities, also dental societies who would like the assistance and cooperation of the State Board of Health on matters pertaining to Oral Hygiene should communicate directly with the New York State Board of Health at Albany, New York.

We are having many calls for Dr. Dowd's services from points outside our free territory. Dentists everywhere should hasten to take up the work of preparing themselves to fill such calls. The field surely is ripe. Public interest in things dental is aroused as never before, and the profession should take advantage of the situation to the fullest extent. The Summary is still able to supply a lecture in pamphlet form, which may be used as it is, or altered to suit conditions, as preferred. We are having many orders for slides, and a few for lanterns. We have the best list of dental slides now extant, so far as we know. For list see the advertising section.

The Toledo Society has installed its free clinic in connection with the District Nurse Association Dispensary, and is now open on Tuesdays and Saturdays. Members of the Toledo Society have agreed to donate their services for the first year. The work of the clinic was opened by Dr. Chester H. Harroun, the oldest practitioner in Toledo, who had several patients. The services of the clinic are free to all poor patients who present certificates from any of the charitable organizations. The room is fitted up as a modern operating room with every up-to-date facility.

John W. Dowd, LL. D., visited Grand Rapids, Mich., February 17 and delivered three lectures, two before the school children, morning and evening, and the other for adults in the evening. The rooms were crowded at each lecture and many were turned away in the evening. The lectures were given under the patronage of the Holmes Dental Club. Dr. Dowd wishes to acknowledge special courtesies rendered by Dr. Dennis Murray.

The teeth of the children of the Waterloo, Iowa, schools were examined recently and a very satisfactory condition found to exist. Some time ago cards were distributed, giving the pupils instructions as to care of the teeth. The result was the immediate purchase of brushes and dentifrices on the part of scores of pupils, and the work of renovation begun. Results were plainly visible at the recent examination.

The free clinic for school children has been opened in Milwaukee on the top floor of the city hall building. The only cost to the city is the necessary plumbing. All materials are supplied by the dental society, and the members are to spend a half-day each. Lectures are to be given in the schools. Taken all together, Milwaukee is well toward the front of the procession.

Dr. J. W. Condit, of Dubuque, one of the best known dentists of Iowa, is delivering lectures to school children on the care of the teeth. Examinations of the teeth of children are rife all over the state, and the educational movement is under full headway.

The Toledo Board of Education has recognized the need of dental education by placing THE SUMMARY'S lecturer, J. W. Dowd, LL. D., on the lecture program for the present term. Dr. Dowd has delivered lectures at several of the schools, and is booked for others later.

The colored dentists of Washington and Richmond have taken up the work of education among the children of their race. The teeth of all colored children in the schools are to be examined, and the necessity for their care and preservation impressed upon them.

The Rochester, N. Y., Dental Society is to repeat the Cleveland experiment reported last month, 100 children to be selected from the poor of the city schools, and treated free of charge, the results attained to be determined by periodical examinations.

The superintendent of public schools of Elmira, N. Y., is writing articles for local papers on the need of both dental and medical inspection in the schools, citing results of such examinations in other cities.

A movement is on foot at Meriden, Conn., to make oral hygiene a part of the curriculum of the public schools. The dentists of the city are back of the matter, and propose to furnish instruction free of charge.

The Washington Dental Society has voted to donate their services for the treatment of the poor of the district. Dental equipments have been installed in several of the hospitals where the free treatment will be given.

Dr. George W. Clapp, editor of *The Dental Digest*, has added his quota to the educational movement, delivering addresses to school children, illustrated by lantern slides. He is a welcome addition to the force. Long may he wave.

Brooklyn dentists composing the Second District Society, are securing a fund of $15,000 for the purpose of establishing free clinics in the schools. A large proportion of the amount already has been subscribed.

Superintendent Buckley, of the Ansonia, Conn., public schools declares that sixty per cent. of his pupils are in need of immediate dental attention. A school clinic will be the next in order.

The Summary lecturer recently visited Mansfield, Ohio, as the invited guest of the superintendent of the public schools, Prof. Hetler, and addressed large audiences of adults and children.

From Oklahoma City comes the good news that a free clinic for poor school children is to be opened at once. The local dental society is the prime mover, of course.

The dentists of New Bedford, Mass., began the examination of the teeth of school children February 16, and completed the work in six days.

The Erie, Pa., newspapers are backing the movement for free clinics, inaugurated by the Erie Dental Association, with more than fair prospects of success.

The dentists of Joliet, Ill., have taken up the work of dental education, and are planning free clinics for the poor.

Indianapolis falls into line with dental examination and free treatment for poor children. Dr. George E. Hunt is actively interested in the movement.

Dr. A. C. Fones, Bridgeport, Conn., has offered the entire upper floor of a new business building for two years for use as a free dental clinic.

Trenton, N. J., is soon to have free clinics if the city council will aid the Mercer Dental Society to the extent of $5,000.

Springfield and Dayton, Ohio, are moving in the direction of dental examination and free clinics.

Easton, Pa., dentists are moving for the establishment of free clinics in the schools.

Omaha, Neb., is planning free school clinics.

Only twenty of the forty-two applicants for licenses passed the Texas State Board at its January session.

Six candidates were granted licenses by the Wisconsin State Board January 25.

WHAT IS DOING IN THE SOCIETIES

One Hundred Dollars Offered for Best Oral Hygiene Exhibit

To the Members of the Southern Branch of the National Dental Association and all others to whom this may come:—

At the Houston meeting a substantial contribution was made to the Oral Hygiene Committee for the purpose of inaugurating a progressive campaign for popular dental education.

At that time your chairman expected to retire from the Oral Hygiene Committee of the National Dental Association and devote all the time at his command to the work in the Southern Branch; but, as matters developed it seemed in the opinion of others necessary that he should continue on the National's Committee.

As it has since fallen out he has traveled some six thousand miles, delivered about seventy-five lectures and addressed approximately fifty thousand persons on the subject of Mouth Hygiene, but principally in Northern and Eastern territory.

This has taken so much more time and energy than was anticipated that the work in the Southern Branch territory has been neglected. While it is encouraging that other sections are taking such an active interest in the work it is much to be regretted that we in the South are far less active and unfortunately less interested.

It was your chairman's plan to secure the co-operation of the Oral Hygiene Committee of each State Association and have them take up the detail work in their several communities.

It was also our plan to have selected some auspiciously situated city in each state which might be regarded as headquarters for that state. In this city there should be a free dental dispensary, lectures in the public schools and an inspection of the mouths of the school children.

So far we have been unable to carry this program through, but it is hoped that by the next meeting in Atlanta we will be able to report more favorably. We plan to make the subject of Oral Hygiene, Dental Prophylaxis and popular Dental Education a conspicuous feature of the Atlanta meeting.

To this end I am asking each of you to whom this letter may come to construct some kind of educational exhibit for teaching oral sanitation to the laity, suitable either for the office, public school, public buildings, such as town hall, court house, railroad station, etc.

Anything which has for its conspicuous feature something which pertains to the prevention of oral and dental disease, from a tooth pick to a sanitary bridge, will be a welcome addition to our exhibit. We especially desire models showing typical mouth conditions.

Drawings which show the influence of mouth conditions on the profile and internal structure of the facial skeleton are greatly desired. Sanitary orthodontic appliances are of especial importance. We want models showing improperly contoured fillings, fillings which have not been properly extended and fillings with unfinished and overhanging margins. The same model should show correct specimens also. A set of models and other illustrations showing calcific deposits and their consequences and the treatment which the patient should give such a case is of great importance. We also want a complete dental armament.

The Oral Hygiene Committee hereby offers one hundred dollars to the man delivering the best exhibit on the following conditions:

First: Exhibitor must be a member in good standing of the Southern Branch. He may become a member at the Atlanta meeting.

Second: Exhibit must be suitable for keeping in the dental office for the purpose of illustrating the influence of typical mouth conditions, methods by which those conditions can best be corrected and especially the technique of mouth hygiene, including both the care and use of the mouth and teeth.

Third: Exhibit must include articulated model showing consequences at the age of about forty years of the extraction of a first lower molar before the fifteenth year. Drawings should accompany this model and show the relative breathing capacity of each nasal fossa in consequence of the deflection of vomer and effect on turbinated bones, also visual focus, etc. Photographs should show profile and full face. Where the exhibit is a skeleton drawings picturing probable consequences will be accepted.

Fourth: Exhibit must contain certain models mounted with both temporary and permanent natural teeth, as wide range of condition as possible is desired. Articulated models are preferred.

Fifth: Exhibit must show a sanitary and an unsanitary orthodontic appliance. One feature of the appliance must be arch expansion. Other features also are desirable. If appliance is made of base metal it should be plated

Sixth: Exhibit must contain models showing sanitary and unsanitary fillings, crowns and bridge work. Base metal may be used but should be plated.

Seventh: Exhibit must show a complete dental toilet armamentarium with typewritten instructions for its use.

Eighth: The exhibit which receives the prize shall become the property of the Southern Branch of the National Dental Association, to be used by them as they may desire and they shall have the privilege of duplicating and dispensing as they wish. However, this shall not prohibit the author or compiler of the exhibit from having the same privilege.

Anyone outside of the Southern Branch membership may enter the competition upon condition that if an outside exhibitor should receive the highest grade he shall receive only fifty dollars as prize instead of one hundred dollars.

It is not necessary that an exhibitor design or make the stuff of which his exhibit is made up. Any or all of it may be a compilation.

The exhibits entering for prize will be numbered and arranged and shall constitute a part of the general exhibition which the committee is planning to make for the meeting, but all except the one receiving the prize may be reclaimed after the meeting.

The judges will be kept in ignorance of the authors of exhibits until after the prize is awarded.

Anyone who has anything pertaining to prophylaxis to be used either in teaching the dentist or the patient the science of immunity is earnestly requested to either bring or send it to the committee headquarters in Atlanta several days in advance of the meeting whether he wishes to enter the competition or not. This invitation and request applies to men outside of the Southern Branch, as well as in it and to manufacturers as well as dentists. However, this does not mean that a dentifrice manufacturer will be given free space for his advertising stand, but he may contribute a sample of each of his articles with his business address without charge.

Magazines, reprints and literature on Dental Prophylaxis will be gladly received by the committee and distributed without cost to the author.

It is now only two months before the meeting, but if each of you who read this letter will do his duty toward the cause of Oral Hygiene the Atlanta meeting will mark an era in the practice of dental science.

The Oral Hygiene Committee of the National Dental Association is maintaining an education and information Bureau at No. 800 Schofield Building, Cleveland, Ohio, at considerable expense. If you have any contribution to make to the committee it will be thankfully received and acknowledged.

If you want to know anything about the work in the United States write to the Bureau and enclose stamp for reply.

The next meeting of the National Association in Cleveland, Ohio, July 25-28th, will be a record breaker in dental society history and it is safe to say that Oral Hygiene will be the most conspicuous feature of the meeting.

The Atlanta meeting of the Southern Branch will be the most important dental meeting to the dentists of the South that has ever been held. We want you to come and bring something for the Oral Hygiene committee, if it is nothing more than a tooth pick.

Write quick to the chairman and tell him what you will do. Send stamp for any desired information, but don't ask foolish questions. Our time is too valuable. However, if you plan to enter for the prize we will take pleasure in answering all questions, foolish or otherwise. J. P. Corley, Chairman.

Greensboro, Ala., Feb. 3rd, 1911.

The Iowa State

As announced last month, the forty ninth annual meeting of the Iowa State Society will be held at Des Moines, Iowa, May 2, 3 and 4.

The growth of this society has been so rapid in recent years and the clinics and trade and supply displays have reached such proportions that it has been found necessary for the 1911 convention to provide greatly enlarged quarters. The committee on arrangements working with the Des Moines Club has secured for this convention the entire main floor of the Des Moines Coliseum, and as a result, the lecture room, clinics and trade displays will all be quartered in the same building and on the same floor.

The lecture room, 104 by 60 feet, with seats for 1,200 persons, and all of the facilities for illustrated lectures, etc., will be in the north end of the building. The arena, which is 137 by 104 feet, will be given over to the clinics and trade displays. In the center of this room will be two rows of chairs for the clinics, twenty chairs to the row, with a spectators' space between the rows 16 feet wide and with an eight-foot aisle back of the chairs for the exclusive use of the operators and their assistants. The clinic room is provided with a diffused light coming in from sky lights over head. On either side of the clinic space will be a display of dental furniture and supplies, in all forty booths, each containing 100 square feet will be provided.

The indications now are that an attendance upon this convention will exceed 1,200 visitors, which will be the largest enrollment in the history of the State Dental Society.

The Louisiana State

Editor Summary:—Perhaps it would interest you to know that there is a health train touring Louisiana doing a grand work educating the people along lines of sanitation, etc., and on this exhibit car there is a good "Oral Hygiene" exhibit, put together by Dr. Walker, of New Orleans. We are proud of it, especially as it is the first exhibit of this kind to go all over a state on wheels, so far as I know. The dentists of Shreveport are working on the subject of lectures in the city schools, which we hope soon to commence delivering, as the superintendent of schools is heartily in sympathy with the movement, as is also the press of the city. P. E. Tanner, D. D. S.

The Kentucky State

The forty-second annual meeting of the Kentucky State Dental Association will be held at Owensboro May 25, 26, 27th, 1911. This meeting is to be the last State Dental Society to hold its annual meeting, according to the circuit established between Iowa, Illinois, Indiana and Kentucky; hence we expect to have an unusually large exhibit as well as a good program. All members of the profession are cordially invited. Full announcement later. W. M. Randall, Secretary, corner Brook and Broadway, Louisville, Kentucky.

The Missouri State

The forty-sixth annual meeting of the Missouri State Dental Association will be held in Joplin, June 13, 14, 15. An elaborate program is being prepared and indications are that this will be the best meeting ever held by the Association.

For advertising space, program or other information address Dr. J. A. Cotton, Chairman of the Executive Committee, Joplin, or Dr. S. C. A. Rubey, Secretary of the Missouri State Dental Association, Clinton.

The Virginia State

The Virginia State Dental Association will hold its 42nd annual meeting at the Jefferson, Richmond, Va., June 14, 15, 16, 1911. There is a very attractive program being arranged and all ethical dentists are invited to attend. Full announcement later.

Seventh Michigan District Society

The Seventh District Dental Society of Michigan has elected the following officers: President, A. N. Hart, Port Huron; Vice President, M. V. Kendrick, Port Huron; Secretary, F. E. Sharp, Port Huron; Treasurer, M. D. Mackoy, Port Huron.

In the February SUMMARY you stated incorrectly that Dr. Burke, of Detroit, had been appointed by Governor Osborn on the state board. Governor Osborn on Jan. 3rd appointed Dr. Frank E. Sharp, of Port Huron, as member of the Michigan State Board of Dental Examiners for the term ending Dec. 31st, 1915. The appointment of Dr. E. A. Honey, of Kalamazoo, was confirmed by the Senate, which left the recess appointment of Dr. Geo. Burke, of Detroit, whom Gov. Osborn had appointed instead of Dr. Honey, but in this way Dr. Burke was defeated. F. E. Sharp, Secy.

Third District Dental Society Elects Officers

Morgan City, La., Feb. 14.—The Third District Dental Society met today and elected the following officers: Dr. S. J. Bourgeois, president; Dr. J. E. Olivier, vice president; Dr. Adolph Bernard, secretary; J. W. Abel, treasurer. Executive Committee—Drs. P. Cyr, H. C. Salles, O. L. Braud, R. L. Zelneck and A .A. Aycock. Jeanerette was selected for the next meeting. Dr. W. F. Spies, of New York, delivered an interesting illustrated lecture on "Pyorrhea." The local committee is busy arranging for the state dental convention to be held in this city June 15, 16 and 17, when some three hundred members are expected to be present.

Texas Dental College Society

Houston, Texas, Feb. 3.—The Texas Dental College Society met this afternoon at the Texas dental college lecture hall for the purpose of receiving new members, which numbered fifteen. The society is a comparatively young organization, its object being to instruct and educate those young men beginning the profession of dental surgery who wish to take part and live up to the by-laws.

Meetings will be held Saturday night of each week and lectures will be delivered by competent speakers on the subject of dental surgery, dental jurisprudence and medicine.

Dentists Form County Society

Union City, Ind., Feb. 1.—An important step was taken by the dentists of Randolph County, Ind., and Darke County, Ohio, in this city Tuesday when they organized the Randolph and Darke County Dental Society. The majority of the dentists of the two counties were present. Officers were elected as follows: President, Dr. Morningstar, Greenville; vice president, Dr. Wampler, Union City; secretary, Dr. Bales, Winchester; treasurer, Dr. Snyder, Winchester; Dr. S. D. Smith, of this city, chairman of committee on resolutions.

Institute of Dental Pedagogics

At the annual meeting of the Institute of Dental Pedagogics, held at Washington, D. C., December 27th, 28th and 29th, 1910, the following officers were elected for the ensuing year:

President, Dr. Donald M. Gallie.

Vice-President, Dr. H. E. Friesell.

Sec-Treas., Dr. Fred W. Gethro, 917 Marshall Field Bldg., Chicago, Ill.

The next meeting will be held in Chicago and the time has been changed to one month later, the dates being January 24, 25 and 26th, 1912.

Ft. Wayne Society Celebrates

Ft. Wayne, Ind., Feb. 3.—The Isaac Knap Dental coterie of this city last night celebrated the twentieth anniversary of its institution. A banquet was held at the Anthony Wayne club and was participated in by about twenty-five members. Dr. L. S. Tucker, president of the organization, presided as toastmaster and short talks were given by practically every member present. Drs. L. S. Tucker and A. H. Heim composed the committee on arrangements for the event.

Grand Rapids, Feb. 1.—Members of the Fifth District Dental Society met yesterday afternoon and night at the Pantlind in regular semi-annual session. Clinical work was the principal business of the afternoon session and the banquet was served at night. Dr. Marcus Ward, of Ann Arbor, was the guest of honor and addresses were made by him and Dr. Perry Hines, of Lake Odessa. Dr. E. R. Jackson, of this city, gave a violin solo. The state convention of dentists will be held here April 10, 11 and 12.

Ottumwa, Ia., Feb. 15.—The dentists of the Burlington and Ottumwa districts of the Iowa Dental society will hold their annual convention in this city March 28 and 29, according to a decision reached last night at a conference of members of each district held at Oskaloosa. The Ottumwa Commercial association convention committee will provide a convention hall and other boosters

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An ex-president of the American Dental Association, writing to the manufacturers of Listerine, says: "The more I use Listerine the better I like it. I use it after any surgical operation in the mouth as an antiseptic wash, prescribing Listerine one part, water ten to twenty parts. After nearly all protracted operations in the mouth, I offer as a gargle and mouth-wash twenty to thirty drops of Listerine in half a tumbler of water, and find that it leaves the mouth in a delightfully cool and pleasant condition, and promotes healthy granulation of lacerated or bruised tissue."

THE DENTIST'S PATIENT

A leaflet designed to convey useful information respecting the care of the teeth. Supplies of this interesting treatise on oral hygiene are furnished free of expense to dental practitioners for distribution among their patients. A specimen copy, together with an order-form, will be sent upon request.

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This being the case, can any dentist afford not to give it a fair trial?

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The *cartridges may be stocked by dealers,* thus obviating the necessity of sending syringes back to be repaired.

The washers, being enclosed in the cartridge, insure more even pressure on the plunger, hence more durability

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	EACH
Imperial No. 3, including wrench	$2.00
Imperial No. 3, complete in paper box, with two needles	2.25
Imperial No. 3, complete in leather case, with two needles	3.00
Imperial Packings in cartridge form, for No. 3 Imperial Syringe, including four needle washers	25

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of the association will assist the local dentists in entertaining the 200 guests expected during the convention days.

Alumni Clinic

The annual clinic of the Alumni Association of St. Louis Dental College will be held in the College building, Grand ave. and Caroline street, Saturday, April 22, 1911. All ethical practitioners are cordially invited to attend. Virgil Loeb, President, Francis P. Mahon, Secretary.

A complimentary dinner will be given by the members of the Southern Branch of the National Dental Association during its meeting in Atlanta, Ga., April 4th, 5th and 6th to Dr. Frank Holland, of Atlanta, Ga.

At the sixth annual meeting of the W. D. Miller Club, of Berlin, Germany, the following officers were elected for the ensuing year: Lee A. Walling, President; E. Lamby York, Vice-President; A. Y. Culver, Secy.-Treas.

World's Oldest Dentist

Dr. Rufus C. Chapman, of Newcastle, Me., who has a record of 65 years of active practice to his credit, is known as the oldest practicing dentist in the world. He is also said to be the first dentist in the world to use ether as an anæsthetic. He also claims to be the third person in the world to realize that the external application of the drug could be used for surgical operations without fatal results to the patients. He has since administered ether for one cause and another more than five thousand times, without losing a case and without results that were serious. Dr. Chapman was born in the town of Nobleboro, May 22, 1822, and in spite of his advanced age is still in excellent health.

A Progressive Dentist Retires

Dr. Howard J. Hill, of Lincoln, Neb., has sold his dental office and practice to Dr. C. D. Richey, formerly of Toledo, O. Dr. Hill is retiring from dental practice and will open a business office in his new purchase, the Brownell block.

Dr. Richey will occupy the office at 233 South 11th street.

Dr. Hill says: I am not quitting work at 45 years of age, simply want to be out doors more and will care for other things I think will keep me busy. I have taken your magazine now for nearly 25 years I guess, anyway it is so long I cannot remember when I started taking it.

DEATHS

Edward W. Stratemeyer, D. D. S.

Dr. E. W. Stratemeyer died at his home in Chillicothe, O., Jan. 20th, 1911, in his 34th year, of tuberculosis, after an illness of nearly a year.

Dr. Stratemeyer was born in Chillicothe, O., Dec. 9th, 1876. He received his preliminary education in the public schools and after attending a local business college he filled many important situations as an expert penman and accountant.

He served in the Spanish-American war. At the close he contracted typhoid fever while in camp and was admitted to the Philadelphia hospital for six weeks. After he was discharged he entered the dental office of Dr. W. G. Hamm late in 1899, and in the year 1900 he entered the Ohio Dental College from which he graduated in the class of '02 and came directly to his home city and enjoyed a large practice until November, 1910, when he was obliged to give up on account of his ill health.

Dr. Stratemeyer was a member of the Ohio State Dental Society, Owls, Psi Omega and charter member and one of the organizers of the Rehwinkle Dental Society (recently organized), where he will be missed as a co-worker in the advancement of dentistry.

He was united in marriage to Miss Grace Pullen, of this city, on October 30th, 1908, who survives him.

Dr. Stratemeyer was an amiable and genial companion and was respected as such by a host of friends outside of the dental profession who will miss him greatly, as he was optimistic in all of his undertakings; he was sought by many for advice and comfort; in fact he was "an all around" good fellow.

W. G. HAMM, D. D. S.

Chillicothe, O., Feb. 4th, 1911.

Dr. John Wesley Orwig, for thirty years a prominent dentist of Middleburgh, Pa., died at Mifflinburgh, February 2 as a result of a paralytic stroke October 14, aged nearly 68. Dr. Orwig leaves behind him a most enviable record for services in the civil war as well as in various Indian outbreaks in the west, where he served as a regular for three years after the close of the war of the rebellion.

Dr. L. L. Little, Greenville, Ohio, committed suicide at the Antlers Hotel, Dayton, between noon of Saturday, January 15 and Sunday morning, January 16, by shooting. Domestic troubles are supposed to have led to the act. He was but 26 years old and a successful practitioner.

Dr. Luther D. Shepard, one of the leading dentists of Boston, January 26, of angina pectoris. Dr. Shepard held degrees from Amherst, Baltimore and Harvard colleges. For ten years he was assistant professor of operative dentistry at Harvard, served a term as president of the American Dental Association, and was president of the World's Columbian Dental Congress, in 1893.

Dr. David H. Longenecker, one of six sons of the man who established the profession of dentistry in Brooklyn more than fifty years ago, and who was followed by all of his sons, was found dead in his room in a sanitarium on the morning of February 4. He was 56 years old, and had practiced continuously in Brooklyn after his graduation.

Paris, Sunday, January 29—Dr. John Evans, the American dentist, residing in Paris, died here today. He was a nephew of Dr. Thomas W. Evans, who died in 1897, leaving a vast estate, the greater part of which was bequeathed to the city of Philadelphia, the residuary legatee, for the erection of the Thomas W. Evans Museum and Dental College.

Dr. G. P. Wright, Seaside, Oregon, was drowned January 24, while rowing home after dark. His oar caught in a fisherman's net, upset the skiff with the result stated. A companion escaped by swimming ashore. Dr. Wright also tried to swim, but the night was dark and stormy and he was lost.

The dead body of Dr. B. L. Cole, Culdesac, Idaho, was found in the bed in his apartments January 23, where it had been since the preceding Thursday. No cause assigned. He was the pioneer dentist of his town, was prominent in lodge work, and was soon to have been married.

Dr. E. S. Gaylord, New Haven, Conn., president of the National Dental Association, has suffered the loss by death of Mrs. Gaylord, who passed away Friday, Feb. 17th, after suffering a long illness.

Dr. Stanley D. Curran, aged 41, committed suicide by shooting, at his home in New York City, February 3. He had long been a sufferer from acute indigestion and chose this means of escape.

Dr. H. M. Bumpus, a Boston dentist practicing at Ceiba, Honduras, was drowned February 9. He had practiced in Honduras about three years and was just under 30.

Dr. Edward B. Wickt, Brooklyn, N. Y., February 19, very suddenly, aged 52. He had practiced in the Williamsburg district more than thirty years.

Dr. Harry W. Grayson, Utica, N. Y., January 28, aged 53. He had been a resident of Utica nearly 50 years.

Dr. Joseph Irwin Leet, Holidaysburg, Pa., January 26, about 30 years of age, of heart failure following an attack of la grippe.

Dr. Zelopheard Hand, Montclair, N. J., February 2, aged 44. He was a graduate of the Pennsylvania college, class 1888.

Dr. W. G. Bishop, Pittsburg, Pa., February 7, aged 67. He was a veteran of the civil war.

Dr. E. P. Dungan, Missoula, Mont., lost his wife by death January 23.

Dr. Harry P. Derr, Mifflintown, Pa., February 7.

ROBBERIES

L. Henry Herman, for three years superintendent for the Dental Supply Co., has been indicted for grand larceny in the second degree, the charge being that during his term of service he removed gold to the amount of about $7,000 from the premises of the company and applied it to his own uses. His plea is not guilty.

Boston, Mass., Jan. 30.—Mrs. Irene Denning, eighteen, bride of a year, mother of a few weeks' old baby, has been arrested in Boston for robbing dental offices of gold. A number of complaints have been filed against her.

Brooklyn, N. Y., Feb. 10.—Goods to the amount of $500 were stolen from the office of Dr. L. Rupert early this morning. The loot consists mostly of unopened packages of gold.

Wilkes Barre, Pa., Feb. 13. About $12 worth of gold was carried away from the office of Dr. C. E. Hobbes last night by a sneak thief, who entered by means of a skeleton key.

About $2,000 worth of dental supplies were stolen from the Climax Dental Mfg. Co., Scranton, Pa., February 15. This is the second robbery in two years.

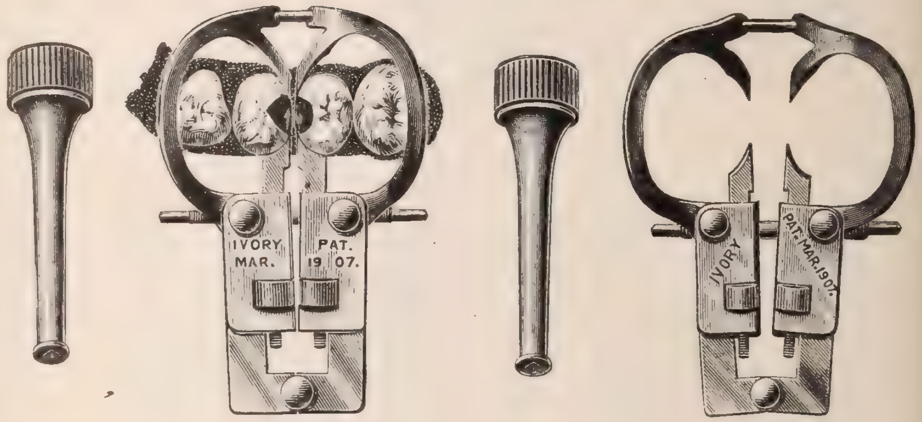
The One BEST

Into every can of SOZODONT TOOTH POWDER there enters 64 years of experience and wholesome effort to provide the one safe and reliable dentifrice to perpetuate the results of your own untiring efforts.

We offer SOZODONT Liquid-Powder-Paste.

Ivory's Adjustable Separator

Patented March 19th, 1907



THE jaws of each ½ of the separator working independently allows for the difference in the size of the teeth, gives a wide range for the adjustment of the jaws where the teeth are irregular, and a perfect control over the jaws so that they need never interfere or cover the margins of the cavity. The spreading force is many times slower than the ordinary screw force, no binding of the screw is possible, and its action is the most powerful screw force known.

Because the control of the jaws is completed, the movement of the spreading force so slow and evenly divided and the sense of touch perfect, the pain in separating the teeth is reduced to the minimum. It is universal for all operations extending beyond the first molars working on either side of the arch by changing the thumb nut.

PRICE FOR EACH $5.00

J. W. IVORY, 21-23 N. 13th St., **Philadelphia, Pa.**

Newark, N. J., Jan. 30.—Reports from Summit state that thieves entered the office of Nicholas Praed and stole gold and alloy to the value of $200. Fortunately they seem to have been frightened away before discovering $300 in cash in the same safe.

DENTAL TROUBLES

Sacramento, Jan. 21.—The old fight against the State Board of Dental Examiners is to open in full swing on Monday, when Senator Hurd, of Los Angeles, introduces a bill which aims to make the requirements for admission to the practice of dentistry less stringent.

Senator Hurd declares that he is going to fight for his measure "tooth and nail." The dental examiners, backed up by the dentists of the state, are preparing to fight back with equal spirit and energy.

New York, Feb. 9.—Selim Worster, assistant to Dr. Frank Doland, 222 East Fifty-eighth street, is held at the Tombs in default of $3,000 bail, on the charge of shooting his former employer, who is lying dead at the Flower Hospital as the result of the shooting alleged to have been done by Worster.

Louisville, Ky., Jan. 28.—Dr. W. Jacob and Dr. R. H. Hodgen, of the National Dental Parlors, were each fined $50 and Dr. W. P. Baker, of the Buffalo Dental Parlor, was fined $30 in Magistrate Frank Dacher's court today after hearings on charges of conducting business under a company name.

New York, Feb. 15.—Two men assaulted and attempted to murder Dr. Leo Evslin, of 263 West 126th street. In a scuffle attending the assault one of the assailants fired at the doctor, but the aim was bad. The assailants were arrested. The doctor was not injured.

Baltimore, Jan. 20.—Fisher Simons and Henry Calvo, two alleged dentists practicing without licenses, were arrested today and locked up. The case is being prosecuted by the State Board of Dentistry.

Baltimore, Feb. 1.—Dr. James H. Tippett, 27 years of age, has been arrested at the instance of a woman patient, charged with attempted assault. Bail has been fixed at $2,500.

Dentists' Responsibility for the Public Health

The New York *Times* and one of its correspondents have been discussing the responsibility of the dental profession for the too general laxity in the care of the teeth and the consequent ill health that is found in every community. In reply to a statement in the *Times* that the dentists are themselves to blame "for the universal and customary neglect" the letter from which the following clippings were made was written:

"Dentists should advertise, and if they shrink from the shrieking style of displays, their various societies should prescribe the form the advertisement should take. To promote their publicity is the object in view, so that the public will know who and where they are and when they may be found. Medical practitioners, who are even more shy and shrinking than dentists are in this regard, will say—and do say—that only quacks advertise. Perhaps they do, and by their advertisements they—or very many of them—do more harm to health than the regulars can ever remedy. Would it not be more sensible in the individual and more to the public welfare if the regulars advertised properly and made themselves known to the public they can serve well?

"Some dentists do advertise, in spite of the ethics, and they are good dentists and are of public benefit, even though they may exaggerate their virtues, but the most of them shrink from print in the advertising columns; and they are not discovered until some oral disturbance or other drives a patient to them, mayhap too late.

"Possibly boards of health might formulate some kind of rules for compulsory advertising. Better still, the students of dental and medical colleges should be taught that the proper promotion of the publicity of their profession is quite as valuable to the people who are to be benefited as the technical knowledge which they acquire, because of what good is that if they keep it from the people who need it?

"This same ethics of secrecy once prevailed in the drug business, and a druggist had his traditions which prevented his advertising as other dealers in human necessities did. But in time some druggist somewhere—he should be discovered and a monument erected to his memory—woke up and began to advertise and to make prices accordingly, and in short order he had all the trade in his town, and the ethics branch went to the wall. Some day the

M. D.'s and the D. D. S.'s will shake the dust off and come out into the open, *pro bono publico.*

SEVEN GOOD HEALTH RESOLUTIONS

From Woman's Home Companion January, 1911

1. I WILL try to do in eight hours as much hard work as I should do in any one day.
2. I WILL devote at least two of the twenty-four hours to such exercise as I find most beneficial.
3. I WILL treat my brain and nervous system with greater consideration; and fifty-six hours each week shall be devoted to sleep.
4. I WILL be kinder to my digestive organs, avoiding all excess, and not asking them to struggle with food for which they have repeatedly shown marked antagonism.
5. I WILL give my moral support to every effort, public or private, in behalf of the betterment of health conditions, so becoming a small factor in the great movement for moral and physical uplift.
6. I WILL arrange, if possible, to supply sufficient pure air for every breath I take, thus better to combat every source of disease that might attack me, to improve my chance for long life and to increase my efficiency.
7. I WILL try to become more intelligent concerning my body, looking with greater respect upon my physical resources, and trying to realize more fully that upon them the force and success of my life largely depend.

"Stone by stone, mankind is building a new Earth; a mansion of many chambers, wherein is warmth and comfort, toil and play, school and home, and every room has doors open into every other room. Soul by soul, it is building a new Humanity; it is making men after the pattern of strength, beauty and love. And in that mansion these mortals shall gather—the children shall fill its heights with laughter, the men set its walls resounding with their excellent labor, the women touch it with the grave miracle of motherhood. Harmoniously they shall live and toil and play. And the name of that mansion where these mortals are to dwell.

"It has many names. Each leader, prophet or poet gives it a special name. But there are only words for the real name which no man yet knows."—James Oppenheim in *American Magazine.*

Expressions of Appreciation

Detroit, Mich., 2 - 9 - '11

"I want to say that I am very thankful to your demonstrator for having called my attention to ALL-IN-ONE dental tablets.

I am a traveling representative, and make all countries of the world. Of necessity, I have been compelled to use every kind of dentifrice made, and in all parts of the world.

ALL-IN-ONE is the best ever. Send me at Detroit, Mich., two boxes, for the enclosed 50 cts.

Success to you, Wayne Eberley.

"All-in-One" DENTAL S TABLETS TRADE MARK

They never disappoint the Patient or Dentist

Gentlemen: Berkeley, California, 2 - 11 - '11

Last November, in Cleveland, I purchased two boxes of your ALL-IN-ONE dental tablets. I am about out of them and cannot find them in the west.

Now permit me as a traveling salesman, to say that you have the BEST dental article, and in the BEST form for my profession that I have ever found, and I do not want to run out of them. Kindly tell me where they can be had on the Pacific Coast, or shall I buy from you by mail?

Yours very truly, E. Lee Hall.

DOCTOR:—Your patients will have kindlier feelings toward you if you interest yourself enough in them to recommend A GOOD DENTIFRICE. . . . .

Samples for the Asking

THE SANICULA CHEMICAL CO. TOLEDO, O.

THE DENTAL SUMMARY

The Magazine That Helps

Vol. XXXI APRIL, 1911 No. 4

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The Indiana State Dental Society
The Kentucky State Dental Society
The Louisiana State Dental Society
The West Virginia State Dental Society
The Northern Ohio Dental Society
The Northern Indiana Dental Association
The Eastern Indiana Dental Society
The Southwestern Michigan Dental Society
Odontological Society of Western Pennsylvania
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L. P. Bethel, M. D., D. D. S., Editor-in-Chief

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REGULAR CONTRIBUTIONS

OBSTRUCTED NASAL RESPIRATION AND ITS RELATION TO DENTAL DEFORMITIES*

By Dr. J. D. Best, Cynthiana, Kentucky

THIS subject has been selected because it is one on which we, as dentists, need to broaden ourselves somewhat. We have all seen disastrous effects of obstructed nasal respiration. At the present time the dental profession has awakened to the realization that in order to successfully correct irregularities of the teeth and jaws, it is first necessary, before commencing any corrective treatment, to remove all existing obstructions in the nose and naso-pharynx.

No phase of the ever-broadening field of dentistry is more eloquent of the changes which are taking place in its practice, than is the development of preventive dentistry. Preventive medicine has come to be recognized as the highest and worthiest branch of medical art, and in the introduction of preventive dentistry the dental profession allies itself with that which is best in medicine.

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*Read before the Kentucky State Dental Society, 1910.

Physician or dentist, our art is the art of healing, but more and more are we learning to add to this the science of prevention. He who, by his skill, transforms a decayed and torturing tooth into a sound and painless member, with years of usefulness before it, is deserving of much gratitude from his patients. But he who, by wise forethought and intelligent care, is able to forestall pain and prevent decay is far more a benefactor and deserving of more praise.

It is with the desire of directing attention to a condition which is perhaps responsible for more dental malformation than any other that this paper is written.

The influence of enlarged adenoids upon the dental structures, while it has received some attention at the hands of the dental profession, has, it seems to me, been accorded but a very small part of the consideration which it deserves.

It has been shown that in the vast majority of cases requiring orthodontic procedure, obstructions of varying degrees exist in the nose and naso-pharynx, so that in order to obtain good results proper nasal breathing must be assured.

The dentist's responsibility in these cases is greater than many of us have realized. This is only natural when it is remembered that a knowledge of this special relation and its importance from both medical and dental standpoints, has only recently been recognized and studied, although up to the present time the teaching in the dental colleges on this pathological relationship has been markedly deficient.

Obstructed nasal breathing is a prime factor in the production of a very large percentage of dental malformations, and obstructed nasal breathing is caused by enlarged adenoids and tonsils.

Dr. Marvin Ross Taylor, of Philadelphia, says, "In my experience of 215 cases between the ages of two and fifteen referred to me for examination during the years of 1907 and 1908, I found that the most common cause of nasal stenosis and consequent mouth breathing was adenoids or hypertrophy of the pharyngeal tonsil."

In the nose and throat clinics of the St. Joseph Hospital in Philadelphia, there were treated 361 children, fifteen years of age or under. The records of diagnosis of these cases show that over 70.5 per cent. were suffering from adenoids and enlarged tonsils. These figures show the prominence of adenoids as a pathological factor in habitual mouth-breathing

Dr. Taylor also says that adenoids accounted for at least 65 per cent. of his private cases presenting coincident dental irregularities. So they are to be looked upon as a most significant factor.

In the first place, we have to take into consideration as anatomical conditions: that the floor of the nose and the median portion of the palatal arch are composed of the same bony structures, the palate processes of the maxilla and the horizontal plates of the palate bone; and secondly, a well established biological truth, that any organ that is not properly used does not properly develop. To the latter law the nasal cavity is no exception. Interference with nasal breathing during the period of the body's growth necessarily inhibits the development of the nasal structure. Through impairment of function the organ fails to expand and in the mouth-breathing child of twelve the intra nasal dimensions may be but a little greater than they were at the age of five and six.

In a normally developing child as the nasal structures increase in size, the distance from the cribriform plate of the ethmoid to the floor of the nose gradually increases, but in a mouth-breather, growth in this direction, as in all others within the nose, is restricted. As related to the other bones of the face we find the floor of the nose and the roof of the mouth assuming a constantly higher position. The roof of the mouth is anchored, so to speak, to a dwarfed nose. The alveolar processes of the maxilla, on the contrary, are more affected in the direction than in the extent of their growth. We have them as a result of the forces operating as described, the median portion of the palate held high up in the early premature position. The alveolar processes, less restricted in their development, lengthen and enlarge, but are drawn to a greater or less extent toward the median line, obliterating the broad dome shape of the hard palate and converting it into a narrow inverted or V shape. Such a palatal arch is necessarily narrow, sometimes more constricted on one side than on the other. Having less than the normal breadth, the teeth have insufficient room for eruption, and so are rotated or displaced, the incisors are pushed forward and project, and in extreme cases, where the development of the entire jaw is sufficiently interfered with, we find the lower jaw which has gone on in unrestricted growth, projecting beyond the upper. This, it seems to me, is the simple, natural and entirely adequate explanation of the relation between mouth breathing and the high-arched palate. There is no condition in childhood which operates to produce nasal obstruction and mouth breathing to anything like the extent that adenoids do. The adenoid vegetations, so-called, consist in an hypertrophy of the pharyngeal tonsil situated in the vault of the pharynx. When normal, this tissue produces no evil effects, but when enlarged it is capable of producing serious disturbances, which, for variety and far-reaching consequences, is equalled, perhaps, by no other condition of disease.

Adenoids are found at all ages, being occasionally seen in the newborn, while remnants of them have been observed in people up in the seventies. The condition more commonly manifests itself between the ages of two and fourteen and may then be found in all degrees of enlargement, from the slight thickening to the enormous growths which completely block the posterior nares, and which untreated are capable of wrecking the development of a child, physically, mentally and even morally.

Under ordinary circumstances, adenoids, if untreated, will atrophy and disappear at or about maturity, but this brings no encouragement to the situation, inasmuch as the damage caused by them will then be largely beyond repair. A familiar figure to the rhinologist is the mouth breathing patient of mature years, whose naso-pharynx is entirely innocent of adenoids, and yet who bears the indisputable evidence of their one-time presence. The partly open mouth, the nasal cavities very much undeveloped, the high-arched palate, with protruding or overlapping incisors, together with the adenoid expression proclaiming the dulled mentality.

The evil effects of enlarged adenoids are almost endless. I shall not try to enumerate them, as such an attempt would probably exhaust your patience as well as my power of description, but will only call your attention to the few of the more common. When of sufficient size to be obstructive, the most prominent symptom is the nasal obstruction with attendant mouth breathing, which we have been considering, though oral deformities are not the only results of obstructed nose breathing, nor are they the most serious. One of the inevitable results of mouth breathing is the admission to the throat and lungs of air that has not been properly prepared. Air passing through the nose is not only filtered, but warmed and moistened. It has been shown that air breathed into the nose at zero temperature is raised to blood heat by the time it reaches the posterior nares. It can be easily seen, then, that air taken directly through the mouth, without this preparation, must have a very injurious effect upon the mucous membranes with which it comes in contact.

One of the most constant and most important of the phenomena attending adenoid condition is impairment of hearing. In just what way adenoids operate to affect the organ of hearing is a disputed question, and cannot be entered into here, but deafness of considerable degree is very frequently caused by them. The operation for adenoids in children suffering from a considerable degree of deafness often results in a restoration of the hearing in a few days or weeks.

Nasal obstruction, mouth breathing, the high-arched palate with dental deformities of all degrees, impairment of hearing and inflammation of the middle ear, the whole range of catarrhal conditions of the nose and throat, impairment of the intellect, and mental and moral obliquities of many kinds, surely this is a mighty crop to spring from so small a source.

Probably all are familiar with the extreme type of mouth breathing which is produced by adenoids of large type. There is the open mouth with dropped jaw, crowded teeth and dull eyes. The nostrils not being in use are collapsed and flattened. Such cases are not uncommon, and the diagnosis may be made from across the street. It is not always so easy, however. Not every child who is ill-tempered, deaf or even a mouth-breather has adenoids. And it may be said at the same time that many a child has adenoid obstruction and breathes with slightly parted lips, who would not ordinarily be suspected of mouth breathing.

I will mention five signs suggesting the presence of adenoids:

First is mouth breathing.

Second comes affections of the ears—inquiry should be made as to presence of deafness and occurrence of earache.

Third, frequent colds, often associated with slight cough.

Fourth, is the child backward in mental development? Children as a rule who have adenoids are backward in their lessons at school.

Fifth, nervous symptoms. Is the child a so-called nervous child? Is he subject to night terrors and does he wet the bed?

There is but one method of treatment worth considering: radical removal is quick, safe and effectual.

In conclusion it should be unnecessary for me to say that I do not intend to assert that all high-arched palates are the result of nasal obstruction, nor that all nasal obstruction is due to adenoids, but I think it is beyond question that a large percent of this class of deformities is the result of adenoid obstruction, and the dentist who fails to take it into account does himself and his patients an injustice. Any attempt to correct dental deformities resulting from this condition, without first removing the cause, is working against the forces of nature and must result in only partial success.

If, on the contrary, the cause is recognized and removed as a preliminary step in corrective work, nature's aid is enlisted in behalf of the operator, and with the establishment of nasal breathing and normal development of the nose, the dentist may be assured that he is paddling with the current and not against it, and that the wonderful achievements of orthodontia being established, corrections once made will stay corrected.

I hope to have shown sufficiently clearly the vital necessity of an early and accurate diagnosis of these cases and the institution without delay of proper treatment. Also that the responsibility of diagnosis and advice regarding treatment does not rest with the medical man alone, for, as I have already said, the dentist sees probably a greater number of these cases in their incipiency, so that he should have at least a general understanding of the symptoms to be looked for in such cases, in order that preventive treatment may be instituted early.

In closing, may I express the hope that in this broad and useful field of preventive medicine and dentistry, where by early diagnosis and treatment so much can be accomplished for the common good of humanity, the specialties of dentistry and rhinology may be more closely allied, rendering more good to one another in a common and glorious cause.

I have administered somnoform between forty and fifty times for patients of Dr. L. S. Givens, a rhinologist of my town, Cynthiana, for the removal of adenoids and hypertrophied tonsils. And we have found that by first giving the patient enough somnoform to barely get him under its influence, and then placing the mouth prop in position, giving him a good dose of 3 to 5 C.C., it lasts plenty long to remove the adenoids, enlarged tonsils and give a thorough scraping of these parts and also a douching.

ABSTRACT OF DISCUSSION.

Dr. I. B. Howell: We have listened to a very interesting paper, and I have enjoyed it very much indeed. In my discussion of it I shall speak only of a few points which seem to me to be of great importance along these lines, and which are not covered by the essayist.

The relation between nasal obstruction and malformation of the jaws and teeth has long been considered by both the dental and medical profession. Only recently has the proper attention been given to the removal of nasal and post nasal obstruction before correcting deformities of the jaws and teeth. Today there is much written on this subject, and general practitioners of medicine are referring their little patients to specialists practicing rhinology and orthodontia. Just here I want to call your attention to a certain class of patients. The patient comes with a complaint of never having breathed well through the nose. Examination of the nose shows turbinates normal in size and structure, septum slightly deflected, as is usually the case in all noses, or markedly deviated; no exostoses, but the inferior turbinates pressing against the septum or against the floor of the nose, or usually both, which is, of course, an abnormal condition.

Adenoids may be present, but their removal does not give the usual relief. The palatal arch is constricted, and of course there are malpositions of the teeth. Whatever the etiologic factors may be, or however well explained by rhinologists, the fact remains that with deformities such as deflection of the nasal septum, spurs and other conditions which bring about partial or complete nasal stenosis, the one great factor in attempting cure is larger breathing space; more room for the oxygenation on which healthfulness of the more or less hypertrophied tissues depend. Many authors in this country, as well as in Europe, have devoted much time and space to causal factors of deviated nasal septum and deformities, such as adenoids, enlarged tonsils, crowded dental irregularities and other abnormal conditions in these regions.

The dental irregularities and high narrow palatal vaults have been ascribed to the adenoid vegetations and nasal defects which caused mouth-breathing; again the adenoids and enlarged tonsils have been laid at the door of the dental irregularity, or the adenoid vegetations have been ascribed entirely to want of nasal breathing and insufficient oxygenation. Many theories have been advanced, all more or less correct, but each in itself insufficient to cover all these conditions; accounting for other abnormalities under discussion by causes ranging from thumb-sucking and accidental injury to the more complicated embryologic and physiologic factors. A careful scrutiny of nearly all such patients will usually reveal other features, and sometimes remote parts of the body unequally, or at least asymmetrically developed. These, therefore, could not result from any of the etiologic factors that apply only to local conditions, and some general law governing a tendency to irregular cell development must be accountable as a first factor in nearly every instance.

Adenoid vegetations are usually, and would appear to be almost necessarily, associated with mouth-breathing and imperfectly developed nares. Yet the fact which Dr. George V. I. Brown, of Milwaukee, brought out in one of his papers on this subject some time ago, namely, that in individuals with cleft palates, even those with wide fissures throughout, one quite commonly finds masses of adenoids, and tonsils much enlarged, demonstrates that in such cases at least restriction of the nasal space did not cause the vegetations.

There seems to be no room to deny the fact that if the external walls of the nares can be moved apart to the end that the breathing space may be thus enlarged, and this by sufficiently harmless methods, the result would be one greatly to be desired, and highly beneficial. This I have been doing now for some time, after the method of

Dr. Geo. V. I. Brown, who is the first to claim originality for the idea of expanding the dental arches in this way for the definite purpose of producing this result. The appliance used for this purpose consists of bands attached to the cuspids and molar teeth on each side so joined that when a bar with screw and nut is attached across the palate in the bicuspid region, the force applied by turning the nut will cause pressure against all of the teeth on each side of the dental arch. With pressure applied so gently that there is no pain and but little inconvenience to the patient, it is possible in all young persons, and it can be done in older ones, to force the maxillæ apart by separation of the median suture extending between the central incisors teeth and on through the central portion of the hard palate.

Evidence of this is given by the fact that the central incisors are moved apart without attachment or direct pressure of any kind being applied to these teeth.

THE TEETH AND THEIR RELATION TO HEALTH *

RECENT examination of school children in many parts of the world shows that about 96 per cent. have diseased teeth.

Think of it! Only about four children in a hundred who are not suffering, more or less, from this preventable disease, this condition of neglect. It would be bad enough if the toothache were all that the little ones had to suffer from this neglect; but the toothache, in reality, is the least part of the trouble.

We may no longer regard the health, the disease, or the loss of a tooth as unimportant; as affecting that tooth and that alone.

Each tooth is related to every other tooth in the mouth, and the loss of one tooth affects every other tooth in the set. Not only does it affect every other tooth in the set, but in some degree it affects every other organ of the body. For, in that marvelous process which transforms food into flesh and blood, which builds up the organs and supplies them with heat and energy, it is required that the first step—mastication—be thoroughly done. The necessary grinding, pulverizing, and mixing with saliva, is perfectly done with a normal set of teeth (normal meaning that each tooth is sound, healthy and in its proper position), providing, of course, that the teeth are sufficiently used for the purpose. But if a tooth is lost, or not used, mastication is interfered with and by that much every organ of the body suffers.

To put it plainer; if a child has a decayed and sensitive tooth on one side of his jaw he doesn't

Fig. 1.

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*Prepared by the Committee on Dental Hygiene, Mich. State Dental Society, 1910, and published by the Society for distribution to the members to be used as a lecture for the public and for distribution among patients.

chew on that side; if he has such a tooth on both sides he doesn't chew at all; his food is swallowed practically whole and the habit of bolting is started. As decay spreads from the rotting apple to the sound one by its side, so does it spread from decayed first teeth to sound second, or permanent teeth, coming in alongside of them. Fig. 1. In a short time, if neglected, the second teeth are as bad as were the first and thus the youth continues to swallow his food unchewed and the habit of bolting becomes fixed. This unchewed food is imperfectly digested; indigestion and bowel troubles follow, and the child, if he survives, becomes a weakly undeveloped man or woman, an easy victim to tuberculosis and the host of ills that prey upon those of low vitality.

Malnutrition is responsible for most of the ills of childhood. Many, perhaps most, cases of malnutrition may be traced to bad teeth, for what does it profit the child the amount and the kind of food he receives, if he is unable to digest and assimilate it? And, likewise, what does it profit the mother, or anyone else thus similarly afflicted? If we have any question about it, statistics will furnish us the answer. They show that because of bad teeth the physical development of the child is seriously retarded; that as the physical development is disturbed the mental capacity is below normal, and that it requires an average of six months longer for such a child to make the eight grades at school.

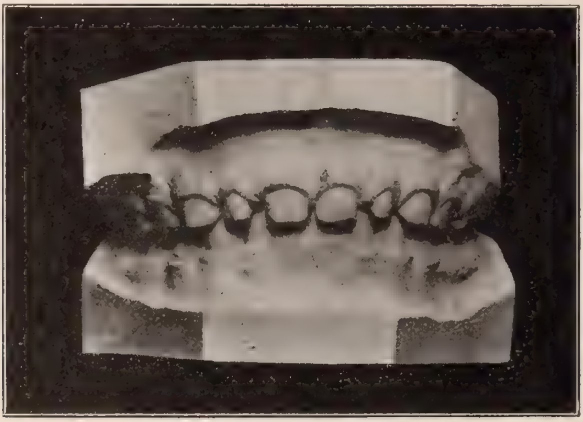

Fig. 2.

The Board of Education of New York city has recently learned that neglected teeth are thus costing the city $800,000 a year.

It is costing us at the same rate. If we look at it only from the taxpayers' immediate point of view, it would be economy for our cities to establish free dental clinics and care for the children's teeth, as they are now doing in many cities in Germany.

In the meantime it is of the utmost importance that the children be taught the proper use and care of their teeth, for by such use and care, much, perhaps most, of the trouble may be avoided.

Let us understand then, at the outset, that a clean mouth and sound, well cared-for teeth are absolutely essential to normal development and good health, and that such teeth used to thoroughly masticate the food, will go a long way toward producing good health.

If we would intelligently care for the teeth we must first know something about them, how many there are in the first set; how many in the second set, when they come in, etc. Fig. 2.

It will help us, perhaps, to remember the number of the first, or temporary teeth if we associate them with the fingers and the toes; ten fingers, ten upper teeth, five on each side; ten toes, ten lower teeth, five on each side. They are usually all cut by the end of the second year, though it may be some months later. The first to appear are the lower front teeth, the central incisors, coming in at about the seventh month and staying until about the seventh year, when they are replaced by the permanent incisors. The others follow at short intervals until the full twenty are all in place, at, or soon after, the end of the second year.

Now, it is of the utmost importance that these twenty teeth remain in place, with their crowns undiminished by decay, until the permanent teeth are ready to displace them. Why is this so very important? Let us see.

The effect decayed and painful teeth have on the habit of chewing the food, we have already considered, but there is another reason. About the time the first front teeth are beginning to loosen, another tooth, the largest and most important tooth of all, is pushing its way up through the gums right behind the last "baby molar" or double tooth. If this last baby tooth, or those in front of it, have been made narrower, or are lost altogether, by decay or otherwise, this big, new, permanent tooth, the sixth from the centre, coming in at the sixth year of age, and not being guided to its proper place by sound first teeth, comes in too far forward. Fig. 3. Sometimes it is the width of half a tooth, sometimes the width of a whole tooth too far forward. This means that the jaw will be just so much too short. Now into this shortened jaw, in front of the sixth year molar, five permanent teeth must find a place. How are they going to do it? Well, you have all seen mouths of crowded, jumbled, overlapping teeth, that's how they do it. Fig. 4.

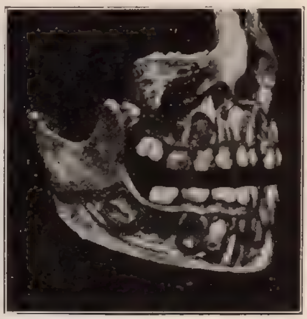
Fig. 3.

The sixth tooth, the sixth year molar, coming in as it does before any of the first teeth are lost, is regarded as a temporary tooth; consequently, many generally intelligent parents view its destruction with unconcern,

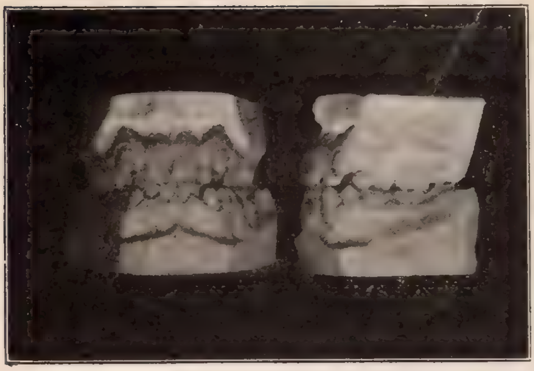

Fig. 4.

thinking it will soon be replaced by another,—a permanent tooth. It will never be replaced. It is the first of the permanent teeth, and as before stated, the most important tooth of all. Upon its correct position and preservation depends, to a large extent, the safety, the usefulness and the beauty of all the other teeth. When the teeth are all in their proper positions they form a beautiful even curve and the features have the balance and contour that nature intended. When teeth are lost, however, or all jumbled together, the jaws are too small, or one-sided, the chin recedes, the face has a weak or a pinched look and the harmony of the features is marred, when not utterly destroyed. Moreover, when the teeth are all in their proper places the grinding surfaces of the upper and lower teeth fit together very closely and, like the mills of the gods, they grind exceedingly fine. Fig. 5. But if one is lost, and especially this first permanent molar, the grinding surfaces drift apart, and if the damage is not quickly and skilfully remedied, the work nature intended the teeth to do can never more be done. Then, too, crowded and irregular teeth are harder to keep clean, they are more liable to decay and the gums are more subject to disease. Remember, then, that the tooth coming in at the sixth year is the first of the thirty-two permanent teeth, which, with care, should last us to the end of life.

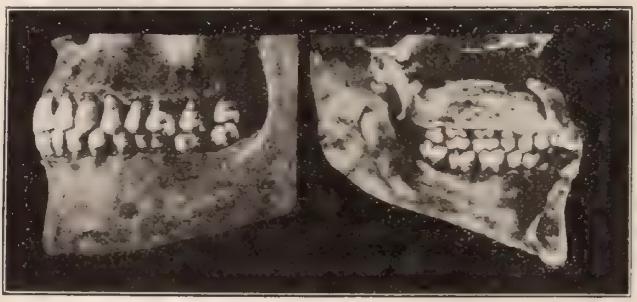

Fig. 5.

If the child is to have strong resistant teeth it is essential that his food contain an ample supply of the bone-building salts of lime. The bottle-fed baby, brought up on the prepared foods of the market, starts with a serious handicap, as, according to food experts, nearly all of these preparations are deficient in the bone-building elements. The best substitute for the nursing baby's natural food is cow's milk. It contains all the elements necessary to the growth and nutrition of the child, but unfortunately, with some children it does not agree. The eruption of the double teeth (deciduous molars) indicates that the child is ready to assimilate solid food and he should be given solid food and taught to masticate it thoroughly. Every meal should contain something that requires good vigorous chewing, for like every other part of the body, the teeth, gums and jaws are strengthened and developed by exercise and they suffer from its lack. Among the foods rich in the bone-building phosphates of lime, wheat stands high. But in the process of making a fine white flour half of the lime salts are removed with the bran. Whole wheat bread, therefore, while not so easily digested, is a better bone builder. Bread should not be eaten before it is twenty-four hours old. Fresh bread forms a soggy mass in the stomach and is very indigestible.

Whole wheat preparations, such as shredded wheat, triscuit, etc., are excellent. Eggs, oatmeal, cornmeal, rice, and the various vegetables all contain the lime salts essential to bone building. Among the meats, beef stands first as a bone builder. A simple mixed diet of the natural foods contains all the elements necessary to good health and good teeth, providing the food is thoroughly masticated and the digestion and assimilation are not impaired.

Experiments, made over and over again, prove that animals fed on food deficient in mineral salts have poor teeth and poor bones, and that if such food is continued the appetite fails and the animals will starve to death rather than eat it. Adding the salts to the food artificially, or giving them as a medicine, does not help matters in the least. The same is probably equally true in the case of the child. If he is unable to obtain sufficient mineral salts from a mixed diet of natural food the use of bone-meal, or the so-called bone-building drugs will, in all probability, avail nothing. Whatever promotes good health—fresh air, sunshine, nutritious food well chewed, hygienic surroundings, plenty of sleep, good habits—all tend to the making of good teeth. Having good teeth good care is required to preserve them. If they are not good they require even greater care.

Until within the last few years dentistry has concerned itself, chiefly, with repairing the damage done the teeth by decay, and in replacing them with artificial substitutes when they were thought to be too far gone to save.

Today the aim of progressive dentistry is to prevent dental disorders rather than to cure them. To keep the teeth clean, highly polished, free from all sharp angles, irritating deposits and whatever tends to promote decay or invite disease. In other words, it aims to put the mouth in a hygienic condition and to keep it there.

Oral prophylaxis (oral, meaning the mouth, and prophylaxis meaning treatment for the prevention of disease) is the term used to designate that department of dentistry which is concerned with this particular work. So important has this preventive practice proved itself that many dentists are now specializing in oral prophylaxis and devoting their whole time to this branch of dentistry alone.

The creed of the practitioner of oral prophylaxis is that cleanliness is the salvation of the teeth: that a clean mouth and clean teeth mean a healthy mouth and sound teeth, and, as a consequence, a bettered physical condition. He aims, therefore, to put the mouths of his patients in a perfectly hygienic condition and to give each patient such instruction as will enable him really to keep the teeth clean. And let it here be said that no one who has not had a prophylaxis treatment knows what a really clean mouth is; and few who have not had instruction ever really clean their teeth. The teeth are not cleaned by the thirty-second-lick-and-a-promise brushing ordinarily indulged in by the majority of the users of the tooth brush. In the first place, it must be understood that the cleaning is not for the purpose of making the front teeth fit to be seen, but to make all of the teeth, on all of their surfaces, clean. This requires intelligent and conscientious effort regularly and faithfully applied.

To clean the teeth, begin by rinsing the mouth with normal salt solution (about a spoonful of salt to a pint of water) forcing it vigorously back and forth between the teeth. Put a quantity of tooth powder in the palm of the hand, dip the tooth brush first into the salt solution then into the tooth powder and proceed to scour the teeth. Use the tooth brush as you would use a broom if you were sweeping a similar surface. Not cross-wise, for that only reaches the high surfaces which need it the least, but from the gums down on the upper jaw and from the gums up on the lower jaw, inside and outside alike. The inside, or tongue side of the teeth, is much harder to reach with the brush, therefore more care must be taken with the brushing; the same also applies to the back teeth on the out or cheek side. For the grinding surfaces, scour back and forth and cross-wise. Dip the brush in the powder often enough to apply it equally to all the teeth and remember that the places hardest to reach are those that need it the most.

A large proportion of the cavities of decay start between the teeth where the tooth brush, however skilfully used, cannot reach. To clean these surfaces, waxed floss silk should be used. Inserted between the teeth it is drawn back and forth until the contact or adjoining surfaces of the teeth are cleaned and polished, care being exercised not to injure the gums in the process.

The teeth should be cleaned at least twice a day, after each meal would be better. Always follow the brushing with a vigorous rinsing with the salt water. In most mouths tooth powder need be used but once a day, preferably at bed time. Avoid the use of ashes, charcoal, pumice stone, etc., as a tooth powder. They are injurious both to the teeth and to the gums. If the expense has to be considered, use precipitated chalk. It is the basis of most tooth powders and may be bought at the druggists for a few cents a pound.

Have two tooth brushes, of a small or medium size, and use them alternately. They will then have a chance to dry out before being used again. An over used, soft tooth brush is the worst kind of economy. After using the brush rinse it thoroughly, dip it in the salt solution and hang it up to dry. Any other mouth wash, of course, may be used instead of the salt water. For ordinary use, however, there is probably nothing better.

It is no easy task to teach children to keep their teeth clean, nor their hands or faces either, for that matter, but the necessity of the case makes it the duty of parents to keep eternally at their children until the habit is well established.

Now, in spite of the best care we can give our teeth, deposits will slowly accumulate on them and there will be some decay, therefore it is necessary to visit the dentist at regular intervals. The frequency of these visits should be governed by the needs of the individual. This should be left to the dentist. In few cases, however, should they be less than twice a year.

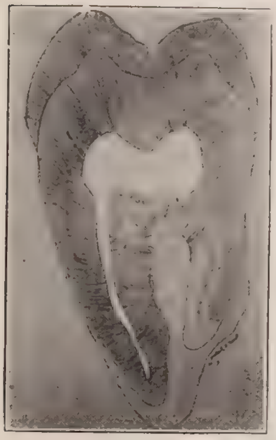

Fig. 6.

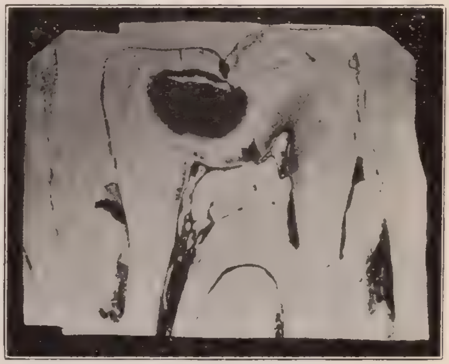

Fig. 7.

When a drop of acid is spilled on the marble slab of a wash stand, it boils and bubbles and if allowed to remain, it dissolves out the lime and leaves the surface roughened. Nearly everyone is familiar with the experiment of soaking an egg in vinegar until the lime of the shell is dissolved out and the egg, unbroken, is then put into a bottle having a neck half the normal size of the egg. Tooth decay is a similar process. It is the dissolving out of the lime of the tooth by an acid. This acid is known as lactic acid, familiar to all as it forms in sour milk. Its presence in the mouth is due to the fermentation, or souring, of food particles adhering to and between the teeth. In the uncared-for mouth the teeth are bathed in this acid, practically all the time, and all the time the acid is at work dissolving out the lime salts of the tooth just as it does with the egg shell, or the marble slab. Now we see why the teeth start to decay at the points hardest to keep clean and the necessity for taking extra care to keep those points as clean as possible.

A tooth consists of a crown, the part above the gums, and one or more roots embedded in the jaw. The outer coating of the crown, the part we see, is called enamel. It is nearly all lime salts, 98%. It is very hard, very compact, comparatively thin and has no feeling. It is intended to protect the sensitive and softer tooth beneath.

Beneath the enamel is the dentine. It forms the bulk of the tooth. It is only about three-fourths lime, therefore is not so hard as the enamel. It is something like bone, having tubes and hollow spaces within it; therefore while enamel decays slowly because of its dense structure, dentine decays rapidly because of these spaces along which the decay spreads. Figs. 6, 7, 8. In the centre of the tooth surrounded by the dentine is the pulp, commonly, but improperly, called the nerve. It has a great many exceedingly fine thread-like branches running outwardly through the dentine forming a very complete signal service, whose duty it is to warn us when danger from decay or other cause threatens the health and usefulness of the tooth.

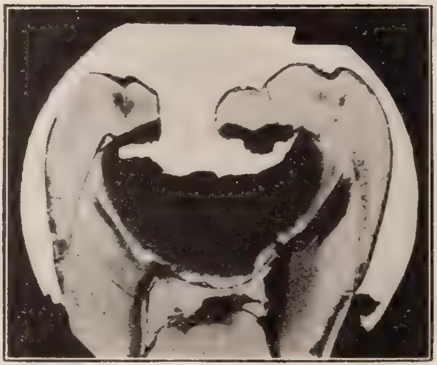

Fig. 8.

A tooth that aches, after one has been eating, for instance, is a tooth in distress, some of the little pulp branches are exposed and are calling for protection. If they do not get it by a proper filling the decay will go deeper and the pulp itself will be calling next. Then the labor and expense of saving the tooth may be increased several fold. This is a case where a stitch in time saves not only a great deal of suffering but saves the tooth to usefulness and comfort as well. On the other hand, if the warning is not heeded, the pulp, after objecting with some pretty severe toothache, popularly called neuralgia, dies. Because the neuralgia is felt, not so much in the tooth as all over that side of the face, the tooth is not suspected, and frequently large physicians' bills are run up in the vain search for relief. Facial neuralgia from this cause is very common; facial neuralgia from all other causes is very rare. When suffering from this trouble, therefore, suspect your teeth and call on your dentist.

It is a common notion that a tooth having a dead "nerve," as it is called, can ache no more. This is a mistake. A dead pulp, like any unburied dead thing, is dangerous. If its poisons escape into the mouth they are mixed with the food and the saliva and swallowed. In the case of mouth breathers the foul gases are carried directly into the lungs and thence to the blood, paving the way for tuberculosis, and generally undermining the health. To one who knows how vile a dead pulp becomes the mere thought of having it in the mouth makes him sick.

We very properly object to the establishment of a garbage reduction plant in our midst, and to the smoke nuisance generally; but because the polluted breath from an infected mouth does not assume the aspect of a black pall, we fancy that it is a matter of no concern, or at most a matter of individual concern. But it is a matter of vital, public concern, for how are we to have pure air in our homes, in our street cars, in our schools, in our churches or other places of public gathering, when with every breath from such a mouth these poisons are being poured into it?

If instead of escaping into the mouth the poisonous gases get out through the end of the root, the tooth becomes sore, the face swells up, pus is formed and bores its way, usually with great pain, out through the jaw bone and gum, forming the so-called gum-boil. Pus is also a poison, and this, too, is swallowed. Fig. 9.

This is a very much more serious condition than is generally known. No one can long be well with such a state of affairs in the mouth. Indeed, many people are continually doctoring for all sorts of troubles who are really victims of blood poisoning due to neglected teeth. Every year many deaths occur from this infection though only occasionally is the real cause suspected. Now, offensive as is a tooth of this character, and dangerous to life and health, it may yet be restored to purity, usefulness and comfort. While it is highly desirable to have the teeth frequently examined and all cavities filled while small, a tooth is not too far gone to save even though nothing is left but its root, providing the root is firm in its socket. A tooth broken off level with the gums may be crowned so naturally as to defy detection, and be made as comfortable, as serviceable, and in many cases more lasting than a well cared-for natural tooth. Fig. 10.

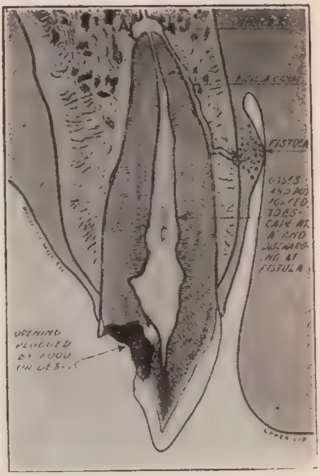
A
FISTULA
GASES AND PUS FORCED TO ESCAPE AT A AND DISCHARGING AT FISTULA
OPENING PLUGGED BY FOOD OR DEBRIS
LOWER LIP

Fig. 9.

Another disease to which neglected teeth are subject is loosening, due to deposits of lime in the form of tartar, and to collections of decaying matter which are allowed to gather and remain on them. This causes the gums to swell, to become tender, to bleed easily and gradually to waste away together with the bony socket that holds the teeth in place. This is a very serious condition as it not only prevents the proper chewing of the food because of the tenderness of the teeth and gums, but the teeth become extremely filthy, and in many cases large quantities of very rank pus are being continually swallowed, the health thus being undermined by two sources. Fig. 11.

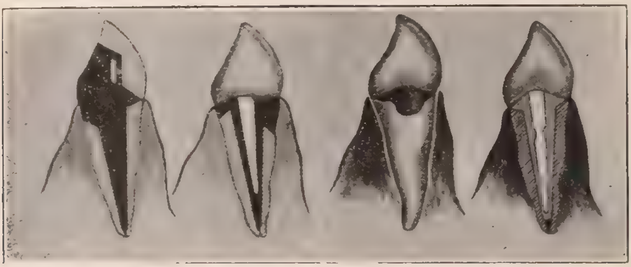

Fig. 10.

If this disease is treated in its early stage it can be cured and the loose teeth tightened. But if it is neglected the teeth will finally fall out. This is a disease of adult life. Here again, absolute cleanliness is the great preventive. This disease, like many others, is much easier to prevent than to cure. Those threatened with it should lose no time in putting themselves under the care of a competent dentist and rigorously following his instruction.

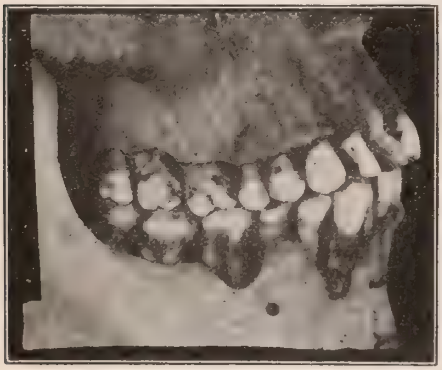

Fig. 11.

Another cause of bad teeth, deformed faces and ill health, is mouth breathing, due to an obstruction of the air passages of the nose by a growth called adenoids; or to enlarged tonsils, or both. This is quite common in childhood and is easily remedied, but if neglected it means a weakened, impoverished body especially subject to throat and lung troubles. Parents should know the evils of mouth breathing and should consult a physician at the first symptom of it in their children. Fig. 12.

During early childhood the bones are very plastic and yield easily to pressure, consequently such habits as sucking the thumbs or fingers, holding objects in the mouth, such as rubber nipples, "comforters," the corner of the bedspread, etc., often produces very grave deformities of the jaws and face. These deformities may be corrected but it is a long and costly operation. Prevention, simply requiring intelligent watchfulness, is much better. Fig. 13.

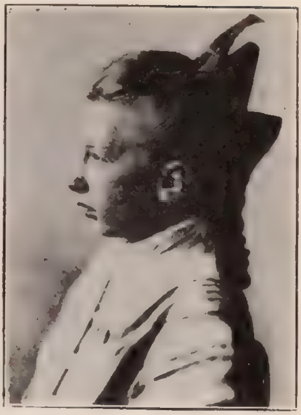

Fig. 12.

The expression, "My teeth are so poor I am just going to let them go and have false ones," is very often heard from the lips of comparatively young people. It implies a compliment to the skill of the modern plate maker, but it is in most cases a very unwise course to pursue. This attitude has been responsible for the needless loss of many thousands of good teeth. It has come down to us from the days of our great-grandmothers, and while in those days it was justifiable, no doubt, in the present advanced state of dental art and science, it is so no longer save in very exceptional cases. If the teeth are really too far gone to save the sooner they are replaced by an artificial set the better, for, as before stated, a mouth full of old, decayed teeth and roots is a menace not only to the health but to the life as well. But let no one needlessly sacrifice his own teeth for artificial substitutes, good as they are in their place.

Much has been done in the past few years to relieve the pain of dental operations, indeed, some of the most dreaded are now entirely painless.

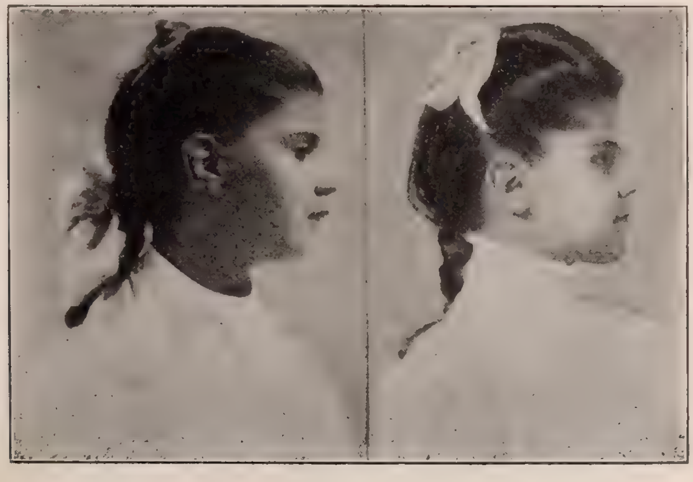

Fig. 13.

Those who are neglecting their teeth from an exaggerated fear of dental work should know that little children and delicate invalids have undergone without a murmur the very work which they lack the courage to undertake. If such as these can have their teeth properly taken care of, who is there that cannot? Dental operations are not pleasant, some of them are still painful, but all can easily be borne, even by the most sensitive. Indeed, the actual pain is not great save only as fear makes it so.

Just a few words in conclusion. Don't forget that the first teeth are just as important, while they last, as the second teeth, and that the value of the second teeth depends very largely on the care the first teeth receive.

Don't forget the number of the first teeth; twenty in all. Ten on the upper jaw, five on each side. Ten on the lower jaw, five on each side.

Don't forget that the sixth tooth, the six-year molar, is a permanent tooth and the largest and most important tooth in the set.

Don't forget that clean teeth do not decay, therefore make every effort to keep the teeth clean, all of them, on all of their surfaces, all of the time, and

Don't forget that clean, well cared-for teeth, and food well chewed are essential to good digestion and good health.

DESCRIPTION OF SLIDES

Fig. 1. Showing decay spreading from one tooth to another.

Fig. 2. The twenty temporary teeth at five years. Note spacing of the teeth due to normal growth of jaw.

Fig. 3. The sixth-year molar being guided to its proper position by sound "first" teeth. The lower sixth-year molar fully erupted.

Fig. 4. No room for the "eye" tooth in this shortened jaw, due to the too early loss of the "baby" teeth.

Fig. 5. An outside and an inside view of a perfect set of teeth showing the close relation of the grinding surfaces.

Fig. 6. Showing structure of tooth.

Figs. 7 and 8. Show how decay spreads after the enamel has been penetrated.

Fig. 9. Tooth with a dead pulp and "gum boil."

Fig. 10. Roots having artificial crowns.

Fig. 11. Loose teeth due to tartar, etc.

Fig. 12. A mouth breather.

Fig. 13. Distortion of face due to the finger-sucking habit and the case after correction.

SILICATE CEMENTS*

By J. R. Pirtle, D. D. S., Hartford, Kentucky.

INDIVIDUALITY, perhaps, is more plainly shown in the practice of dentistry than in any of the professions, or even the various vocations of the commercial world, and it is difficult to believe that a skillful class of men could use the same materials with such contrasts in results as clinical reports show in the use of silicate cements; some state they have nearly perfect results, while others such a large proportion of radical failures that they soon discard it without an effort to correct their mistakes. If more details of methods and operative skill had been given, however, we would be better able to form an intelligent opinion on the subject.

The dental profession has long felt the need of a filling material which would imitate in every way the tooth structure, and yet possess the practical quality. In this, Ascher's Artificial Enamel, with its wide range of shades, translucent appearance and porcelain-like hardness, approaches most nearly the requisite, and with a good shade selection, thoroughly mixed and carefully applied makes the most beautiful fillings I have ever seen, being vastly superior to gold in color.

The requirements for a perfect filling material are many, and we could hardly expect to find a substance which would meet all of them under all conditions; in the selection of the proper one for a case, the wisdom of the operator is many times put to the test; he must consider the position, adaptability, color, edge strength, crushing resistance, etc.

Probably artificial enamel is lacking more in the last two points than any other. When comparing the relative value of filling materials for any particular cavity it is not always the density and edge strength that will benefit the patient most, but is rather the combined strength of weakened tooth structure and filling as applied, that best resists the wear, and with the least injury to the vital forces of the patient by the operation.

Many long operations that would greatly exhaust the vitality of a delicate nervous patient may be avoided by the use of artificial enamel the result being equally as good as if gold had been used.

Cavities of the six anterior teeth are especially indicated, approximal cavities not extending to the incisal edge, labial cavities of the incisors and cuspids and the distal surfaces of cuspids, which gives us much trouble, are positions which I have found it very satisfactory, although I have used it in bicuspids, and even on the grinding surfaces of molars with surprising success.

Having decided upon a case I would proceed to thoroughly excavate the cavity, giving a general retentive shape as would be necessary with any permanent filling material. The margins should be at right angles with the surface of the tooth, preparing after the order for porcelain inlay work except avoid beveling the margins, as the enamel requires bulk for strength and being packed in the cavity, it is unnecessary to extend margins as required in inlay work. Now with the shade guide carefully select the shade before the dam is applied as the moist tooth will give the exact color.

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*Read before the Kentucky State Dental Society, 1910.

Having shade required, place the non-metallic instruments in a convenient position, an absolutely clean mixing slab, kept for this purpose only, laid upon the bracket and a celluloid strip slightly coated with cocoa butter ready; take out desired amount of powder as per shade selection, then the liquid, being careful in opening the bottles that no paraffin or other foreign substance fall into either powder or liquid to be worked into the mix. Now, we would apply the dam, drying the cavity and make any further preparation of the cavity that may have been omitted.

The mixing of A. A. E. differs materially from oxyphosphate cements in that it requires a more gradual addition of the powder and less spatulation. The manufacturers of this product claim that the powder is decomposed by the liquid before crystallization begins. Using too much powder weakens and changes the shade of the mass, too little will produce shrinkage and will lack density. I find it best to use up every particle of powder and when the mass has become stiff enough to draw on the slab it is about right to pack; provided that there has been no delay and crystallization has not begun.

Packing the cavity perfectly is not altogether an easy matter owing to the sticky condition and if great care is not exercised, the retentive points and deep recesses will not be well filled and will lack density: pack firmly using the agate or tortoise shell points, and, if an approximal position, now use the celluloid strip; press down firmly and burnish against the tooth, using heavy pressure. All manipulation, burnishing, etc., should be discontinued by the time crystallization begins to take place. Never use oiled packing instruments as the mass should never be contaminated with any foreign substance. Always let the filling thoroughly harden, after which remove excess, finishing first with medium coarse then with a fine strip. The finishing will be found much slower than is apparent, and if caution is not exercised, especially when vaseline or cocoa butter is used on the strip, scratches will be left and the filling readily stains. I can see no advantage in vaseline or oils in polishing as they make the mass transparent and prevent the operator from seeing the scratches, overlaps and defects. The best possible gloss, where it can be used, is obtained by the celluloid strip. I doubt, however, the possibility of properly completing a filling by this method. The filling should be kept dry for at least thirty minutes from the time crystallization begins, or twenty minutes after polishing is completed. Lastly coat with hot paraffin and remove the dam.

This preparation is exceedingly delicate and we know of no other filling material so easily abused or so deceptive in its apparent easy manipulation and the careless, unobserving operator is sure to meet with failure and discredit the material.

Cleanliness, non-metallic instruments, proper exclusion of moisture, retention, even and not over spatulation, and proper consistency are absolutely necessary. Should any one of these points be neglected the filling, however applied, will be imperfect. I have never had trouble with discolored filling, and believe all discoloring comes from contamination with some foreign substance, from failure to properly polish or allowing the moisture too soon.

The value of these fillings depends largely on the minute detail of manipulative technique and the chemical action developing sufficiently while protected.

We cannot be too exacting in regard to cleanliness with instruments and slab, and the bottles should have the stopper replaced as soon as the contents have been removed for the filling. This material will not permit abuse and ''to aim at a little better than a cement filling will never stimulate the operator to close observation.'' A skilled dentist may produce good results with poor materials and equipment, but when supplied with those capable of a high degree of development the opportunity is presented to assert his skill with results most gratifying.

There are many uses to which enamel may be applied with good results; repairing old fillings, to restore facing on bridges or Richmond crowns, and correcting the joint in ill-fitting, bandless crowns, are some for which I have found it very satisfactory. On one occasion I had a patient with the left upper first molar with all the crown gone except the buccal and palatal surfaces. These only extended to about half their original length, having decayed and crumbled. The patient objected very much to a gold crown, or an alloy filling, and, as an experiment, I set three platinum pins in cement, one in each root, after the cement had thoroughly hardened; I then made a band with a celluloid strip, held in position with the matrix, and filled with enamel, polishing down, restoring the original cusps. I had the pleasure of seeing this filling a year later, and was gratified to see that practically no change had taken place.

I do not claim that Silicate Cement is perfect and is suited to all cases and conditions, but it certainly supplies a long felt want; it has its place, and we hope for a development that will make it satisfactory to our profession and a blessing to humanity.

ABSTRACT OF DISCUSSION.

Dr. M. H. Daily, Paris: I have only been using artificial enamel for one year and I want to thank Dr. Tileston for telling me about it at our last meeting at Crab Orchard.

Dr. Pirtle has said very truly that possibly there is no filling that each step of which requires greater accuracy and greater care of the instruments used in the filling, than the artificial enamel. I was not long in learning that a good measure of the success of this as a filling material depended upon absolute cleanliness. I think that it is a good filling, but I believe that in using this successfully we should always use the rubber dam. After I had been using this filling for two or three weeks I took up my slab one day, which I had been using for other cements, and I noticed that after I had put some artificial enamel on it, that it at once turned dark. On noticing from time to time I discovered that it *was the tincture of iron from the other* mixtures which would readily impregnate the artificial enamel. As to the exact time for the insertion of this filling, I think Dr. Pirtle's experience is about true; to me there seems to be just a psychological moment at which to insert the filling. Not while in the creamy state and not after it begins to crystallize. Only experience will teach you. I do not find it always necessary to use a lubricant. I never use vaseline and I have never used the cocoa butter. The chief stumbling block in my successful use of this filling material has been to get instruments that were suitable for its insertion. We can get the little ivory needles but they break very easily. One night I noticed my wife knitting with needles I fancied. I find that I can use a great deal more force with these needles. You who have trouble in this way, I would advise you to try a set of them.

Dr. Tileston, Louisville: I think whenever a new material is introduced to the dental profession that we are apt to expect too much of it. We shall find that there has been opposition to every new material that has ever been introduced. In most cases the objection to it comes from those who either have not used it at all or have not used it sufficiently to appreciate it. The artificial enamel has been very satisfactory in my hands. Worked in places where it can be properly protected from stress I think it is one of the best filling materials we have at the present time.

Some have made the objection that it will wash out. My experience has been that it does not wash out. It stands where you put it; if it shrinks, it is because you have not mixed it right. When you see it at the end of a year you are pleased with it. If you are not, then I fear the fault has not been in the material but in the operator. The successes with it, even if they be few, show that the possibility is there. If out of a dozen fillings with it, I get six good ones, I feel pretty well satisfied. I am confident that in some way the failures have been my fault.

Dr. Albreight, of Indianapolis, told me that he mixed it thin and packed it in the tooth with the small glass points; when he has done this he then let it remain for thirty minutes; then he would proceed to dress it down and polish it. He said most any time you drop in his office you might see patients sitting around reading with the rubber dam on the mouth. I mix it a little thicker than that, though I am using it thinner than I used to. It is an important thing to have small points to use with this filling material. We should not use *iron pointed instruments.* I use small tortoise shell points which I shave down. The avoidance of all metals is very important.

Dr. Alexander Andrews, of New York, told me several years ago that he was setting inlays with it. Two years ago I set a porcelain inlay with it, which I had the pleasure of seeing not long since and found it just as good as when it was set. If used rightly I believe we could make a practice of setting porcelain inlays with it. Though I have put them in with it that would come out the next day. I cannot tell you how to use it; you will just have to try and let your own personal experience with it teach you.

Dr. Burk: Any of us can make the instruments necessary for the insertion of this material by the use of a little skill. I use the *little glass rods with success.* I just add this suggestion to what has already been said.

Dr. W. E. Grant, Louisville: I also wanted to say that the little glass rods are good to use like Dr. Burk does; also to put small points of platinum in the ends of the glass rods in treating teeth. Especially for the application of aconite and iodin. It can be so much more readily cleaned. You can burn off the aconite. It is a good material from which to make your fine instruments to work artificial enamel. I have also used the needles mentioned by Dr. Daily; I have a set of them.

Dr. Fred Wilder, Louisville: At the Buffalo Dental Meeting they had on exhibit there everything a dentist could require. I did not notice anybody buying the artificial enamel. I believe it is a good thing, however. I have used a great deal of it. I think we have to take a great deal of care in its use; and that we should not mix it too thin. I use the cocoa butter or vaseline. I allow it to harden first before I begin to polish it, so that there will be no drawing away from the margins of the teeth. Also use a little paraffin on it to protect from moisture.

Dr. W. M. McCall: I just want to suggest that I find one precaution very necessary to take and that is to see that you get liquid that is fresh. If you have noticed, sometime you will find a little white sediment in the bottom of the liquid bottle. I do not believe you can make successful fillings with such liquid. Again, be careful not to begin burnishing it until after the material begins to crystallize. I believe if these two things are looked after, our success will be much greater. In my hands I have to say that it has been a success. I have had many failures but I have also had many successes.

Dr. Schneider: I have been using this material since I first received the samples of it sent me by the Harvard people. I felt that something along that line as a filling material was necessary if we want to carry out our ideals. I have done some work with it of which I have been very proud; on the other hand if you want to see a man who has had dark colored fillings of it, you want to look upon me. I have listened with interest to different men talk about mixing it soft and others hard. I have had successes with both kinds of mixing and I have had failures with both. It is only by one's own careful experience that you can learn. Take white as a basis, I presume that Asher's enamel was first made in one color and then pigmented to the different colors; so if you only want to buy one color, you can buy some oil pigments and accomplish wonders with it by careful study of the exact shade you need. From the shade guide you must be careful to select the shade from the wet teeth rather than from the dry teeth. As to cavity preparation, I prepare my cavities as I would for a gold filling. I do not depend upon the adhesive qualities.

Dr. Clark: I believe a large majority of the failures in the manipulation of this filling material arise from our lack of time and proper care. I have made a number of failures but I have attributed them to lack of time. If we take more time and do not hurry too much to polish like we should, I believe we will get better results.

Dr. Leete: I would like to ask what has been the effect of hyperacidity upon the artificial enamel as noticed from some of you who have used it largely.

Dr. Kettig: I have had a good deal of success with silicate cement and about three times as many failures. I have worked it in a way since it has been on the market. I am letting down on the use of it pretty freely lately. I used it for a time, but I found out that I was dealing with a buzz saw and I am afraid that some of you will find out the same thing. The longer you stick to artificial enamel the less practice you will have in the long run. I think the use of silicate cement has been responsible for the shifting about of more practice than any other material we have had in the catalog. They tell you if you make a failure that it is because you do not follow out a certain set of instructions; you might be going along trying to obey those instructions when in a few months they come out with a new set of instructions and call in the first set; a few months more and they put out a new liquid and call in the old liquid. They are trying as best they can to sell off as much of that stuff as they can before all of you reach the conclusion I have been forced to. It is certainly a filling material which has a greater assiduity for the bad than for the good. It is fine in many respects but damnable in others. Is it not a waste of time to use material that is so terribly unreliable? Another thing in the selecting of the shades, I find that those shades do not turn darker in use, but on the other hand, a few shades lighter, so that you must select your shade expecting it to turn lighter rather than darken up to the tooth as is the case with most enamels. It must be at least two or three shades darker to start with. Another thing is in the selection of the cavity to be filled with this material. You had better not risk it in a frail thin walled tooth. You had better put in a tooth with good strong walls, in the mouths of people of middle life where you have those great big yellow teeth. I am letting down on the use of your artificial enamel and I predict that it will not be but a few years before you will all be doing the same thing.

DR. NEWMAN: My experience has been that you had better select a cavity where there is no danger of the pulp being exposed or you will have trouble.

DR. PIRTLE: We, of course, must use discretion and good judgment in the selection of our cavities for artificial enamel. I feel that a great many of our failures in its use come from the lack of this. The use of the rubber dam is important. I would like to ask Dr. Kettig if he used the rubber dam always for his fillings?

DR. KETTIG: I never use a rubber dam for anything. I hope as long as I practice never to use it again. Why would you have ninety-nine failures out of every hundred when only one man did not use the rubber dam? Dr. Pirtle has gotten into a tight place and he asks questions to get out of it. He says you must be very careful in the selection of your cavity and yet in his paper he says that from an old root of a crown he built up a crown out of the artificial enamel. I do not see where the discrimination comes in when you can build a whole crown out of it.

DR. PIRTLE: That, of course, was an exceptional case. If anyone doubts that, if he will just come down to Hartford I will show it to him. The point regarding the liquid is an important one.

AROUSING INTEREST IN THE CARE OF CHILDREN'S TEETH*

By William Hynes, D. D. S., Stithton, Ky.

RECENT examinations of school children's teeth in many parts of the world show that about 96 in every hundred children have diseased teeth. Think of it: Only about four children in a hundred who are not suffering more or less from diseased teeth! This would be bad enough if the toothache were all that the little ones had to suffer as the result of somebody's neglect, but, as a simple matter of well-known fact, the toothache is the least part of the trouble. In fact, toothache is not the trouble, nor any part of it; it is simply the cry of the nerve, trying to arouse the attention to the fact that something is wrong; the call of the nerve to be relieved from the poison that is killing it. Statistics show that on account of poor teeth the mental and physical development of the child is seriously retarded. The more the physical development is disturbed and retarded, the less, in general, is the mental capacity of the child. The worse the teeth the worse, as a rule, is the school standing of the child. As decay spreads from the rotting apple to the sound one by its side, so does it spread from decayed first teeth to sound second, or permanent teeth, coming in alongside of them. In a very short time, if neglected, the second teeth are as bad as the first. Because of bad teeth the child swallows its food unchewed and the habit of bolting is formed. The youth, also, for the same reason swallows his food unchewed and the habit becomes fixed. The unchewed food is not digested; indigestion and bowel troubles follow; and the child, if it survives, becomes a weakly, undeveloped man or woman, an easy prey to tuberculosis and the host of other ills which prey upon people of low vitality. This is not an overdrawn statement. It is amply proved by statistics. No claim is made, of course, that bad teeth are the sole cause of disease. Abuse, in like manner, any other part or organ of the body as important as the teeth and disease is sure to follow. Now, a very large part of this suffering—half-starved bodies and the weak brains follow it naturally, grows out of pure neglect, and by far the greater part of this neglect is due to ignorance. And it seems strange, indeed, that the world should have been so tardy in realizing the importance of the teeth and the importance of their intelligent care. This condition of ignorance may be charged to what seems to be an innate tendency upon the part of scientific men generally to dig and delve in search of the obscure and the unimportant, comparatively, overlooking entirely the much more important and perfectly obvious facts immediately under their observation.

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*Read before the Kentucky State Dental Society, 1910.

Let it be understood at the outset that a clean mouth and sound, well cared-for teeth are positively essential to perfect health; even to the average of good health; and that such teeth used to masticate the food in the manner intended by nature, will go a long way towards producing and preserving that health. If we would intelligently care for the teeth we must first learn to know something about them; how many there are in the first set; what they are; how many are in the second set; when they are cut; the relation of the first set to the second, etc. It will help us, perhaps, to remember the number of the first, or temporary teeth, if we associate them with the fingers and toes. Ten fingers—ten teeth in the upper jaw; ten toes—ten teeth in the lower jaw; five on either side, both in the upper and lower jaw. The first teeth are usually all in by the end of the second year. The first to be cut are lower front teeth, then central incisors appearing, as a rule, at about the seventh month, and lasting usually until about the seventh year, when they are replaced by the permanent incisors. The incisors are the cutting teeth. From the same root word we have the word scissors, you know. The other temporary teeth appear at short intervals, until, by the end of the second year, the entire twenty are in place.

Now, it is of the utmost importance that these twenty teeth remain in place, with their crowns undiminished in size by decay, until the permanent teeth are ready to displace them. Why is this so very important? Many parents think that the first teeth amount to very little, and that the sooner they are gotten rid of the better. There could not be a more serious mistake. Let us see.

We have already considered the effect that decayed and aching teeth have upon the habit of chewing the food. Teeth, especially teeth that are just coming in, require exercise, precisely as do all other parts of the body. When the first teeth are decayed, painful or lost, the permanent teeth do not have exercise they need, because the food is bolted; that is swallowed only half, or less than half, masticated. But there is another reason why the retention of the first teeth is so important. About the time the first front teeth are beginning to loosen another tooth, the largest and most important tooth of all, is pushing its way up through the gum, right behind the last "baby molar" or double tooth.

If this baby tooth, or those in front of it, have been made narrower than normal, or have been lost altogether on account of decay or premature extraction, the big new tooth, which is a permanent one, the sixth from the center, and coming in at the sixth year of age, and not being guided into its proper place and kept there by sound first teeth, comes in too far forward, out of place. Sometimes it is the width of half the tooth, sometimes the width of the whole tooth, too far towards the front. What difference does that make, some may ask. Isn't the tooth there; will not the other teeth force it into its proper place? No. That's just the difference it makes; that is just the trouble.

When the first big, strong, permanent, most important tooth comes in too far forward the jaw is shortened by just that much. And it remains too short. It is generally supposed that the jaw shapes and controls the location of the teeth in what is called the arch; that is, the semi-circle in which the teeth are located. But that is another of the popular mistakes. The teeth control the size and shape of the jaw.

Now, into this shortened jaw, in front of the sixth-year molar, five permanent teeth must find a place. How are they going to do it? Well, most of you have seen mouths filled with crowded, jumbled, crooked, overlapping teeth; and that's how they do it.

The sixth tooth, the sixth-year molar, coming in as it usually does and should do, before the first or temporary teeth are lost, is usually regarded as a temporary tooth also, and is allowed to decay, even by parents who mean to give their children the best of care, under the mistaken impression that it will soon be replaced by another and a permanent one. But it never will be replaced. The six-year molars and all the other molars are cut but once. Once lost they are gone forever. They never will be replaced, except by an artificial substitute, a poor dependence at best. And this six-year molar is the most important of all the teeth. Upon its proper location and preservation depends, to a very large extent, the safety, the beauty and the usefulness of all the other teeth.

When the teeth are all in their proper position they form a beautiful even curve, the sort of curved lines that nature delights in; and the features possess the contour and balance that make the face so attractive. When the teeth are lost or all jumbled together the jaws are too small, or they are one-sided; the chin recedes, the face has a weak or pinched look, the lips hang open, and the harmony of the features is marred, when not entirely destroyed.

There is, of course, a much more important phase of the subject than mere appearance, although that is important enough, often making or marring the entire life. When the teeth are all in their proper places, the grinding surfaces of the upper and lower teeth fit together very closely, and, like the mills of the gods, they grind exceedingly fine, preparing the food as it ought to be for the digestive process that follows. But if one is lost, especially if that one be this first permanent molar, the grinding surfaces drift apart; and, if the difficulty is not quickly and skillfully remedied the work that the teeth are intended to do never can be done properly. Then, too, of course, crowded and irregular teeth are much more difficult to care for, to keep clean; they are much more likely to decay, and the gums are much more subject to disease.

Remember, then, that the tooth coming in at the sixth year is the first of the thirty-two permanent teeth, which, with the care that all the teeth should have, ought to last each of us to the end of life. If the child is to have strong, tough teeth it is essential that its food contain an ample supply of the bone-building salts of lime. And these salts are essential for other purposes as well. When it is known that the epidermis or skin, the bones and the teeth are all built of the same kind of cells, and that these cells depend for their perfection upon salts of lime, the importance of this kind of food readily will be recognized.

The bottle-fed baby, brought up on prepared foods so abundantly on the market at this time, starts with a very serious handicap. According to the authority of scientific men, who are making these subjects the study of their lives, these prepared foods, nearly all of them, are deficient in the bone-building elements. The best substitute for the nursing baby's natural food is cow's milk. Don't forget this; don't be deceived by alluring advertisements, written by men who either do not know or do not care to know what they are talking about.

The eruption, or cutting of the deciduous or temporary first molars indicates that the system of the child is ready to assimilate solid foods. And if he is given really solid foods and taught to thoroughly masticate them it will be well with that child. Every meal should contain something that requires good, vigorous chewing. Like every part of the body, the teeth, gums and jaws require and are developed by exercise, and suffer from lack of it. Among the foods rich in the bone-building phosphates of lime, wheat stands high. But in the process of making fine, white flour, half of the lime-salt is lost and withdrawn with the bran. Whole-wheat bread, while not so easily digested, is a much better bone-builder. Any form of whole wheat, containing every particle of the grain, as nature makes it, is a perfect food, and should be largely used. No bread should be eaten before it is twenty-four hours' old. Fresh bread, especially that made of the fine flour, forms a soggy, fermenting mass in the stomach, and it is not only very indigestible but furnishes a breeding place for the germs of fermentation, resulting in sour stomach, colic and many other ills.

Whole wheat and whole wheat preparations, such as shredded-wheat biscuits, etc., are excellent. Eggs, oatmeal, corn meal, rice and nearly all vegetables contain the lime-salts essential to bone building. As also does beef. A simple mixed diet of the natural foods will contain all the elements necessary to good health and good teeth, provided that they are well masticated, and provided that digestion and assimilation are not impaired.

Experiments made over and over again prove that animals fed on poor foods, that is, those that are deficient in mineral salts of the kinds necessary in body-building, have poor teeth and weak bones; and that, if such foods are continued, animals will starve to death rather than eat it. In this the animals are guided by a sure instinct that no amount of "tasting good" can deceive.

Adding the necessary salts to the food artificially, or giving them in doses as a medicine, does not alter the case in the least. These experiments and their results apply equally to the child. If it is unable to obtain a sufficient supply of the necessary salts from a mixed diet of the natural foods the use of the bone-meal or the so-called bone-building drugs, are likely to prove of no avail. Whatever promotes good health—air, sunshine, nutritious foods, well chewed, hygienic surrounding at all times, plenty of sleep, good habits—all these tend towards the building up of good, strong, solid healthy teeth. Good teeth have been acquired, good care is necessary in order to preserve them through life. If the teeth are not good they require even greater care, even poor teeth may be preserved almost indefinitely,

ORAL HYGIENE AND DENTAL PROPHYLAXIS

Until within the last few years dentistry has concerned itself chiefly with repairing the damage done to the teeth by decay, and with replacing them with artificial substitutes when too far gone to be saved. Today the aim of progressive dentistry is to prevent dental disorders rather than to cure them. To keep the teeth clean, highly polished, free from all sharp angles, irritating deposits, fields for the culture of pathogenic, or disease-breeding germs, or whatever tends to invite disease or promote decay. In other words, it aims to put the mouth into hygienic condition and keep it there.

The special method employed to bring about this natural, healthy, hygienic condition, and to maintain it after it has been brought about, is known as prophylaxis—oral prophylaxis. Oral means the mouth; prophylaxis means warding off or preventing disease, or that which makes for the preservation of good health. Oral prophylaxis then means treatment that is efficacious in the prevention of dental disorders, or diseases of the mouth and teeth.

So important has this preventive idea become in the minds of the dental profession that there are now, in many cities, prophylaxis specialists, who devote their entire time to this branch of dentistry. The creed of oral prophylaxis is that cleanliness is the salvation of the teeth; that a clean mouth and clean teeth mean a healthy mouth and sound teeth, and, as a natural consequence, a bettered more resistant physical condition generally. Based upon statistics, it is estimated that 72 men, women and children die every hour in the United States from diseases that might be prevented, and it is now known that many of these preventable diseases have their origin in an unhygienic condition of the mouth and teeth.

The aim of oral prophylaxis is to do its share in the prevention of this needless loss of life; to bring about a condition of health and well-being so far as the mouth and teeth are concerned; to keep that part of the digestive tract, that is under our control, in a normal healthy condition, and, with the help of the patient, to keep it there permanently. How is the patient going to do his part, by far the larger share in the work of maintaining the health of the oral cavity? Certainly not by the ordinary thirty-second lick and promise "cleaning" indulged in by the vast majority of people who use the tooth brush.

In the first place, it must be understood that the purpose of the cleaning is not merely to make the front teeth fit to be seen, but to make all the teeth, on all of their surfaces, positively clean. And this means intelligent and conscientious effort, regularly and faithfully applied.

To properly clean the teeth begin by rinsing the mouth with salt water, about a teaspoonful of salt to a pint of water, warm or cold, as may be preferred, forcing it vigorously back and forth between the teeth. Do this with the same vigor and determination that you would put into doing anything that you thought would prolong your life, increase its happiness or usefulness, or increase your income. It is just as important as proper mastication, or as the proper setting of a broken arm. Put a quantity of good tooth powder into the palm of one hand. With the other moisten a good tooth brush with the salt water and dip it into the powder. Then proceed to SCOUR the teeth. Use the tooth brush as you would the scrubbing brush on your kitchen floor or in your bath tub. Scrub the teeth, not merely brush lightly over the surfaces.

Do not use the brush crosswise of the teeth. You will only touch the high surfaces that are naturally clean anyhow, and you may work great injury by making cavities in the teeth above the enamel at the gum line. Begin at the gums on the upper jaw and brush downward; begin at the gums on the lower jaw and brush upward; inside and outside alike. As the inside or tongue-side of the teeth is harder to reach with the brush, it requires much more care to get them clean and keep them clean than the outside. As a matter of fact, because they are not seen they usually get much less. Ignorance on this score is much to be lamented. A wealthy, prosperous and successful man of sixty recently stated that until he was past fifty he never had tried to clean the inside of the teeth, thinking that they did not need any care at all.

Scour the grinding surfaces back and forth, crosswise; dip the brush into the powder often enough to apply it equally to all of the teeth, and remember that the surfaces that are the hardest to reach need the most cleaning. Make the cleaning of the teeth as necessary to your comfort as the bath, or the washing of the hands and face. It is far more important. Take plenty of time. Ten or fifteen minutes at least once a day. Wash a few minutes four or five times a day. Remember, that the mouth is a veritable breeding ground for disease germs, and that they multiply rapidly if undisturbed, while the raking and scraping given them by the proper use of the tooth brush prevents their increase almost entirely.

Two or more tooth brushes should be used, of a small or medium size. Those with wedge-shaped points on the rows of bristles are best, as they work in between the teeth, where most care is needed. Use your brushes alternately, so that they will have a chance to dry out before using again. Never buy a cheap brush. Never use a brush after the bristles begin to fall out. An over-used soft brush is the poorest kind of economy. After using the brush, rinse it thoroughly in the salt solution and hang it up in the rack to dry. Any other good mouth wash may be used in the place of the salt water. Powder need be used in most mouths but once each day, preferably at bedtimes, if used as suggested.

A large proportion of the cavities in teeth start between them, where the brush, however skillfully used, cannot reach. To thoroughly clean these spaces is, therefore, of utmost importance. For this waxed floss silk, preferably flat, should be used. Insert between the teeth and draw back and forth until all these surfaces are perfectly clean. Do this at least twice each day, preferably after meals. Be careful in the use of the toothpicks. If wood is used, select those of some wood of dense, close grain, that does not splinter, such as orange wood. The end of the pick should be flat. Picks are now made of special woods, and rendered antiseptic by being treated with aromatic solution, which aids in the preservation of the health of the spaces between the teeth. Be careful not to puncture or irritate the gums when picking the teeth. It is no easy matter to teach children to keep their teeth clean, but the necessity of the case makes it the duty of every parent to keep eternally at their children until the habit becomes fixed. In spite of the best care we are able to give our teeth, deposits will slowly form on them in most mouths, and there will be some decay. Therefore, it is necessary to visit the dentist at regular intervals. The frequency of these visits should be governed by the needs of the individual, and this should be left to the knowledge and judgment of the dentist. In very few cases should they be less frequent than twice a year.

CAUSE OF DENTAL CARIES OR TOOTH DECAY

If a drop of acid is spilled upon the marble top of a washstand it boils and bubbles, and if allowed to remain, it dissolves out the lime and leaves the surface roughened. Nearly all of you, no doubt, are familiar with the experiment of soaking an egg in vinegar until the lime in the shell has been dissolved and the egg, unbroken, then put into a bottle having a neck half the normal size of the egg. Decay of a tooth is caused by a similar process.

The lime in the tooth is eaten out by an acid. This acid is known as lactic acid, familiar to nearly everyone. It is the acid present in sour milk. Its presence in the mouth is due to the fermentation or souring of food particles adhering to and between the teeth.

In the mouth that is not cared for the teeth are bathed in this acid practically all of the time, and all the time the acid is at work dissolving out the lime-salts in the teeth, just as the acids do with the egg-shell and the marble slab. This shows us why teeth start to decay at the points hardest to keep clean. It also shows why extra care should be taken to keep those points as clean as possible. Decay rarely starts on the exposed surface of a tooth.

STRUCTURE OF THE TEETH

A tooth consists of a crown, the part above the gums, and one or more roots embedded in the jaw. The outer coating of the tooth, the part that we see is called the enamel. It is nearly all lime-salts, 98%. It is very hard, very compact, comparatively thin, and has no nerves; therefore, it is without feeling. Its purpose is to withstand the wear of grinding, and to protect the softer, sensitive parts of the tooth beneath.

Beneath the enamel is the dentine. It forms the bulk of the tooth. It is only about 75% or three-quarters lime, and is, of course, not so hard as the enamel. It is something like bone, having tubes and hollow spaces within it. Therefore, while enamel slowly decays, because of its dense structure, dentine decays rapidly because of its softness, and on account of the spaces within it, allows the germs of decay to spread and multiply without resistance.

In the center of the tooth, surrounded by the dentine, is the pulp, commonly but improperly called the nerve. It has a great many exceedingly fine, thread-like branches running outwardly through the dentine forming a very complete signal service, the duty of which is to warn us when danger from decay or other source threatens the health and usefulness of the tooth.

A tooth that aches after one has been eating, for instance, is a tooth in distress. Some of the little pulp branches are exposed and are calling for protection. If you do not give it, the pulp itself will be calling next, and by that time the chances are that the labor, pain and expense of saving the tooth have been increased many fold.

Here is a case in which a stitch in time may save not only a great deal of suffering, but, by a simple, inexpensive filling, the tooth may be saved to usefulness and comfort. If, on the other hand, the warning is not heeded, the pulp, after objecting with all of its might with some pretty severe aches and pains, commonly called neauralgia, and other things, gives up the fight and dies. Because the pain is not felt so much in any particular tooth as all over that side of the face, the tooth may not be suspected, and frequently large physician bills are contracted in the vain search for relief.

Facial neuralgia, so-called, of this character and from this cause is very common. Facial neuralgia from all other cause is very, very rare. Therefore, when suffering from this cause, suspect your teeth at once and consult the dentist.

It is a common notion that a tooth having a dead nerve, or pulp, can ache no more. This is a mistake. A dead pulp, like any other unburied thing, is dangerous. A menace to the health not only of the mouth but of the entire body. It is a breeder of poisonous germs. If these poisons escape into the mouth, they are mixed with the food and saliva and swallowed. And, in the case of mouth-breathers especially, the foul gases created are carried to the lungs, and thence to the blood, paving the way for tuberculosis, and a general undermining of the health. To one who knows how vile dead pulp becomes, the very thought of having it in the mouth makes him sickly. And how are we to have pure air in our homes, our schools, our churches, when with every breath from such a mouth, these poisons are poured into it? As a matter of simple protection, we should avoid inhaling the breath from such a mouth.

If, instead of escaping into the mouth, the poisonous gases get out through the end of the root, the tooth becomes sore, the face swells, pus is formed and bores its way, usually with great pain, out through the jaw bone and gum, forming the so-called gum-boil. This pus is also a poison, a dead thing, and this too, is swallowed, and this is a much more serious condition than is generally known, or may be generally believed. No one can long be well with such a state of affairs, a veritable poison factory, in the mouth.

Many people are constantly ill, constantly under the care of the physician, doctoring for all sorts of troubles, who are simply the victims of blood poisoning, due to neglected teeth. The commonly called nervous diseases are largely due to this cause. Every year thousands of preventable deaths occur from causes originating in the condition described, although very seldom is the true cause suspected by anybody—but the dentist.

Offensive as is a tooth of this character and in this condition, and dangerous as it is to health and life itself, it may be fully restored to usefulness, health and comfort. While it is highly desirable to have the teeth frequently examined and all cavities filled while small, a tooth is not beyond redemption and salvation although nothing is left of it except the root, providing that root is firmly held in the socket. A root broken off level with the gums may be crowned so skillfully as to appear perfectly natural and defy detection; and it may be so applied as to be as comfortable, as serviceable, in many cases, more lasting, than a well-cared for natural tooth that is perfectly sound. Another disease to which neglected teeth are subject is loosening, due to deposits of lime in the form of tartar, and to collection of decaying matter, which are allowed to gather and remain on them. This causes the gums to swell, to become tender, to bleed easily, and gradually to waste away, together with the bony socket which holds the teeth in place. This is a serious condition, not only preventing the proper chewing of the food because of the tenderness of the teeth and gums, but the teeth themselves become exceedingly filthy, and in many cases large quantities of very rank pus are being continually swallowed, the health being thus certainly and surely undermined by the two enemies, which ably assist and abet each other, one by preventing proper preparation of the food, and the other by converting the most of it into rank poison. If this trouble is attended to in its early stages it may be removed and the loose teeth tightened and restored to usefulness, but if neglected, the teeth finally fall out and end the chapter in disaster. Here, again, absolute cleanliness is the great preventive. Teeth that are kept clean cannot possibly get into this distressing and often fatal condition. Here, again, dirt, decay, degeneracy and death go hand in hand together. This disease is common to which human flesh is heir, is much more easily prevented than cured. Those who are threatened with it, or suspect that they are, should lose no time in putting themselves under the care of a competent dentist, and then follow religiously and vigorously the instructions given.

The expression, "My teeth are naturally so poor that I am going to let them go and have artificial ones," is very often heard from the lips of even comparatively young people; and while it implies a compliment to the skill of the modern platemaker, the thought back of it is usually a very unwise one to entertain, and the course a most unwise and unsatisfactory one to pursue. It is hard to imagine a set of natural teeth that are not or cannot be made much more useful, satisfactory, sanitary and comfortable than the best plate ever turned out of a dental laboratory. This attitude has been responsible for the needless loss of millions upon millions of perfectly sound teeth. It has come down to us from the days of our grandmothers, and while in those days it may have been justifiable, in the present advanced state of the dental science and art, it is so no longer, save in very rare and exceptional cases.

If the teeth are really too far gone to be preserved, the sooner they are out and replaced the better; for, as stated, a mouth full of decayed teeth and roots is a menace not only to health but to life itself. But let no one needlessly sacrifice his teeth for artificial substitutes. Good as they are, most necessary in their place, and much as many of us owe to the advancement of dentistry in these last few years, they are but poor substitutes at best.

You will be perfectly safe in trusting the judgment of the dentist in such cases. The time has gone by forever when a dentist will extract a tooth that may be saved, merely to satisfy the whim of the patient. Preservation and restoration of the natural teeth is the proper field for the exercise of the dental skill; and few, indeed, and daily growing beautifully fewer, are the dentists who do not recognize this fact, and conduct their practices accordingly.

MOUTH-BREATHING

Another cause of poor teeth, crowded teeth, malformed jaws and unbalanced faces, ill health and their attendant train of suffering is mouth-breathing, due to a growth in the nose called adenoids. This is quite common in childhood, is very easily remedied, but if neglected it means a weakened, impoverished body, subject to coughs and colds, throat and lung trouble, leading to tuberculosis. Time will not permit going into this important topic in detail, but it is the duty of parents to watch their children, particularly while sleeping; and if mouth-breathing is found to prevail, to consult a physician at once. Sucking thumbs and fingers in early childhood, the use of "baby comforters," rubber nipples or other objects held between the teeth, often produce serious deformities of the growing jaws, and should be avoided with far greater assiduity than the avoidance of contagion from the simple diseases common to childhood.

Just a few words in conclusion:

Don't forget that the first teeth are just as important, while they last, as the second teeth, if not more so; for the position, soundness and value of the permanent teeth depend largely on the care that the first teeth receive.

Don't forget the number of the first teeth; twenty in all, ten in the upper jaw, ten in the lower jaw, five on either side of both cases.

Don't forget that the sixth tooth, the six-year molar is a permanent tooth, is the largest and most important tooth in the entire set.

Do not forget that clean teeth do not decay; that a clean tooth cannot decay; and therefore always remember to make every effort to keep the teeth clean—all of them, on all of their surfaces, all of the time.

Don't forget that clean teeth, well cared for and food well chewed, are essential to good health.

And don't forget that you are quite welcome to ask any questions on the subjects mentioned, if everything that has been said is not perfectly plain, simple and clear to you.

ABSTRACT OF DISCUSSION.

Dr. J. W. Clark: Dr. Hynes is inclined to put us back in the primer class by telling us that we ought to know the number of temporary teeth; the number of permanent teeth and when they erupt. He states that by examination 96% of the public school children have been found to have bad teeth. I think, in view of that fact, that we must have the best conditions in our public school of any children in the country. Last week we examined three of our public schools, one in the center of the city and one in the east end and one in the west end. We did this through Dr. W. Ed Grant, our city health officer. We examined 1,364 children. Out of this number we found 691 with fair condition of the mouth and 408 with bad; which means that about 80% had bad mouths. Now in the condition of the gum, we found about 33 1-3% bad. We have 759 or about 50% that did not use the tooth brush, 76% that had cavities in their mouths, 449 who had had no fillings and 441 instances of malocclusion. On account of the situation of these three schools, I think that we ought to have a very fair percentage. It is surprising how many parents allow the sixth year molar to decay, thinking it is not a permanent tooth. I think we will have to do some of the kindergarten work to teach the parents. It is not the 20th century dentist that is behind the times. I think the trouble lies in ignorance or carelessness on the part of the public. We are trying to educate the public along this line. What can we do for the little folk to disabuse their minds of the idea of pain as connected with the dentist's office? If we could take this feeling of fear from them we would have them coming to us. This idea of fear is impressed upon the child's mind by the older ones talking before it about what a dreadful place the dentist's office is. They come to us only when they are brought or sent and then expecting to be hurt. If we could impress upon their minds early in life how to use the tooth brush and how the failure to use it causes the teeth to pain you, it would go far to correcting this idea of fear as connected with the dentist's office. I make it my practice to instruct each child that comes into my office how to use the tooth brush and the necessity of coming to the dentist every two or three months to have the teeth looked over.

Dr. Robt. Canine introduced Prof. Dowd: I want to say that I have just had a proper introduction to this Kentucky Association in the adjoining room. I have always from my early days had a fondness for Kentucky. I have been making talks on this subject since the first of February and believe I have talked to about 75,000 people. We had the opening of this campaign in Cleveland, Ohio, where it was my privilege to see an audience of 5,000 people in Grey's Armory. I am glad to see the work that is being done here in our sister state. Everybody in our own state feels that the public ought to pay for the inspection of the public school children's teeth. We believe it is going to be so in the State of Ohio. In this case we will be able to double the amount of work in this direction next year. It will pay the state in the long run. People seem to be willing to listen if we can only get it before them. Statistics show us that six million people in the United States die annually that ought not to die. One hundred and seventy-five die annually from tuberculosis. With the proper laws of hygiene observed this percentage could be greatly decreased. I want to say just here, though, that I think dentists are about the most modest set of people that I have run upon. They are too modest to push their work as they ought to. I am going into this subject fully at the Male High School tonight and I hope it will be possible for each of you to be present.

Dr. Stacy: I think that a great wrong the parents do the children is to have them feel that they can protect them from all pain. Children should be taught that they must have pain. The physician does not hesitate that this must be done. He will talk kindly to the child but firmly. We are, as Prof. Dowd says, too modest to tell the parents that certain things must be done. If the teeth have been neglected until they are in such a condition that the treating of them require pain, we should frankly tell the child so.

Dr. Elliott: I think there is too much said around the table about the dread of the dentist. This feeling of dread of the dentist is instilled in the child from the time he knows anything. The mother will go with the child and sympathize with it. This is one of the great faults of the layman. The parent need not always go with the child to the dentist's office. They should go the first time and see what the conditions are and what the treatment will have to be. I frequently say to the mother when she brings a child to my office, "send this child to me at such and such a time." I can do more with the child usually without the mother. I have frequently had fathers bring their children to my office and remark as they were leaving, that they suffered more than the child during the work.

Dr. Best: If we do not take care of the little ones we will not take care of them when they grow old. It is just as unreasonable for the child to have decayed teeth as it is for the older person. In the examination recently made it was found that about 80% of those examined had decayed teeth. You cannot expect a child to do good school work with such a condition. The food cannot be properly chewed, consequently cannot be digested and we have resulting all kinds of stomach and digestive troubles. I have talked with the teachers at their institutes on the subject of oral hygiene. In Madison county the teachers were instructed to take it to the school room and devote such time as they could do it; and to take every opportunity to impress the parents with the fact that their children cannot do good school work with their mouths in unsanitary conditions. I think that every member of this association cannot do better than to take time to think about this problem. We have done good work and the thing is not to let it stop with this. Let everybody put his shoulder to the wheel and push.

DR. HYNES: If Dr. Clark thinks that I have put you in the primer class, let him get out into certain parts of our state and see just what the conditions are. He will find out that it is necessary to treat the subject in this manner. The only thing some dentists in the rural sections seem to think is that they must make a set of teeth. The thing to do seems to educate the parents and children and help them to preserve their teeth until they are grown and we will have a much stronger and more vigorous people than we now have.

MEDICAL INSPECTION OF SCHOOL CHILDREN*

By Guy Kiefer, M. D., Detroit, Mich.

I AM very glad of this opportunity of talking to the members of your society, and realize, as everyone does who has been engaged in this work for some time, that the work is largely one of education, everything that we do is along the lines of a campaign of education. I know of no body of men that we could get together, or whom I could address, who take more interest in the campaign of education for the progress of the medical management than the members of this society, if I am to judge by the actions taken by the members of the District Society of the City of Detroit, consequently I am glad of this opportunity of addressing you, because I believe that of all of the things and methods that we have adopted for the prevention of disease and prolongation of life, perhaps none is of more importance than medical inspection of schools. We try, in various ways, to conserve health, to reduce mortality; we do it by attention in the way of sanitation, in the way of ventilation, in the way of the food supply, the milk, by the abatement of nuisances, particularly of dust and smoke, and in various other ways. The one way in which to preserve health and lower mortality is to improve, as far as possible, each individual's physical health. It seems to me the way is to build up the highest possible resistance, as by strict attention to medical inspection of schools.

Now, I might give you a long history of what we mean by a "System of Medical Inspection of Schools," but will try and be brief and will try and tell you about how the work was started in Detroit.

The work was started on a small scale; I believe in starting everything on a small scale. I believe in system, in education; if we get education we get public sentiment, and after we get public sentiment we get results, because, after all, the enforcement of laws rests entirely upon public sentiment. We started here, several years ago, on a small scale, to have physicians, medical men, in the schools for the purpose of inspecting the children to see whether any of them were suffering from contagious diseases of any kind, the idea being to prevent the spread of contagious diseases. In that work it was found that the children that suffered most frequently from contagious diseases were the ones who were not strong in body; they suffered most from physical defects. We saw very soon that it would not be a complete system to go about and examine children for symptoms of contagious diseases; we could do much better work by examining them, as far as possible, for physical defects, and if we could have these remedied we not only removed the handicap for the child, but made it possible for that child to go through the school without having contagious diseases. It was a health problem, a preventive medicine problem. We then, as we progressed, looked after the physical defects of the school children. We had two systems of cards, one for the exclusion of children who were suffering with symptoms of contagious diseases, the other, a so-called recommendation card, being sent home to the guardian or parents of the child, telling them about the physical defects found in the child, and to have them remedied. The results accomplished were fair—pretty good, but we found that a great many of these children who were sent home for minor contagious troubles, and those for whom a correction of physical defects had been recommended, either stayed out when they were excluded, or came back without having the defects remedied, so that the next thing very apparent was that it was necessary to have somebody to follow these cases up. The only way to achieve results was to have a competent person make the parents understand what it meant. Then we started to put in a nurse or two. In the schools in which we have no assistance from the nurse we have physical defects remedied at the rate of 10 or 15 per cent. of those recommended, and in the schools in which we have assistance of nurses we have physical defects corrected in 60 to 80 per cent. of those recommended. This shows plainly on the face of it, that the system is incomplete without the aid of school nurses. Now, what has the dental society to do with all this? It didn't strike us so forcibly at first just what the largest percentage of physical defects in school children would be, where we would find them the most, but as we went along we saw very soon that by far the greatest percentage of defects in school children are to be found in the mouth, and particularly in the teeth, in the work that belongs to the dentist, and when we did so we realized that not only did this bad oral condition interfere with the nutrition of the child, rendering it in such shape that it could not carry on its work, but we realized that it was a focus of infection, and we resolved very soon, without having any very definite figures to compile a statement, from what we saw, that the children carrying about contagious diseases, the children physically down below par, the children who had to remain out of school and were backward most frequently, were the ones the condition of whose mouths were a focus of the disease. About a year and a half ago—we had been examining children for their physical defects, such children as were sent to the medical inspectors by the teachers,—we undertook in a limited number of examinations to find out just what the condition will be probably in the larger number. So through the aid of your District Dental Society here, we examined in one of the schools, a year ago last fall, 300 pupils, without any reference to whether the teacher thought they needed to be examined, without reference as to whether they had been absent from the school, without reference as to their apparent condition, just simply the way they came in the schools. We examined 300 of them, had a physician come there and had a dentist come there also and examine them carefully, completely from head to foot for any possible physical defects, and we found that about 200 out of the 300 had some one or more physical defects outside of the teeth, that is, some physical defect like adenoids or enlarged tonsils or enlarged glands of the neck; that out of 300, 270 were in such condition that their mouths needed the attention of the dentist, bad condition of their teeth; 270 of the 300 needed correction. That was a pretty big percentage taken out of children not supposed to have anything the matter with them; in whom the teeth were supposed to be all right. So the work done by the dentists was taken up by the district dental society with the result that we discussed what was the possible advantage, what could be the possible advantage of inspecting these children's teeth, a great many of which children are poor, and in whom the condition should be remedied, but who had no place to go. If no remedy was at hand, if they had no place to go, what was the use of saying anything about it? Very liberally your society came and said, "We will put up a free clinic, we will furnish the services, material and the whole thing. The only thing we ask of you is that when you examine children you have the nurse look them up and inquire as carefully as possible into the financial condition of the family, and send us children with the recommendation card only that are suitable and fitted to come to a charity clinic." They did open up the clinic in Grace Hospital here in this city at which these children were received. During the last school year we (and by "we" I mean the District Dental Society under the supervision of the Board of Health,) have done work which does not look very large in numbers, but which is more far-reaching than anything else that has been done by the Detroit Board of Health, and I believe that when you correct the physical defects of school children, and particularly when you correct these terrible conditions of the mouths of school children, you teach them cleanliness. Besides improving their physical condition and making it possible for them to masticate their food you teach them cleanliness. If you don't teach them this oral hygiene, you allow them to be negligent and slovenly, and slovenliness leads to immorality and immorality leads to crime, and consequently our allowing these things to go on without remedying them would result in an increase in crime.

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*A talk before the Michigan State Dental Society, 1910, by Dr. G. Kiefer, Health Officer, Detroit.

Within the last year I had a little argument one day with a police officer of this city about the medical inspection of schools. We had some parents who insisted on absenting their children from school or allowing them to come to school troubled with a condition of their heads, due to extreme uncleanliness heads covered with lice. They were excluded, excluded, excluded again; the nurse went there again and again and tried to get them to remedy the condition, and tried to argue with this family.

We finally took it up with the police department and tried to force them, and I had an argument with the police official and he said, ''I don't see that you are doing much, anyway, making lots of fuss here about a child having a dirty head, or hurt finger, or something like that, and I don't see as that has much to do with it.'' He said, ''I had lice in my head when I went to school.'' I said, ''That is all right; your mother took care of them, but these mothers will not take care of their children. We are not merely trying to put lousy heads out of school, but we are trying to teach the parents and the children that the community and this city will not stand for slovenliness, which leads to immorality and crime.'' About that time we were having a series of crimes here perpetrated by young girls. I said, ''If you had had an opportunity to teach children how to be decent citizens, to teach them cleanliness as to their mouths and persons and physical condition, you would not have to chase down such criminals as you are chasing down today, because that is what we would prevent.'' So that this system of medical inspection of schools means more than mere correction of physical defects.

Now, I want to refer just briefly to a few figures of the work that has been done here. It is not so very extensive, and yet something has been done, and the work that has been done by the Dental Society has meant a good deal of work for the men at its disposal.

During the last year the entire number of pupils examined by our Medical School Inspectors was 50,501, of whom 3,499 were excluded for contagious diseases. I can say that there were among this number 818 cases of tonsilitis, and 12 cases of scarlet fever. The number of pupils in whom physical defects were found was 2,118. Of these 598 had defective eyesight, 204 diseased eyes, 136 defective hearing, 906 enlarged tonsils or adenoids, or both, and 210 had defective teeth. These were only cases referred because of their condition, which was apparent to the teacher and the doctor. During the year beginning Oct. 23, 1909, to May 7, 1910, the following work was done by the dentists in the Free Dental Clinic of the Detroit District Dental Society, 234 children visiting the clinic, and the work done was as follows: Prophylactic treatments, 61; roots treated, 57; fillings inserted, 207; extractions, 248; temporary relief, 254.

This is far-reaching. When you reach 234 different children, you have taught 234 different homes that attention must be given to the mouth. It means that that child's physical condition will be better. It does not mean that it will look better, never suffer from the toothache, but the entire physical condition will be improved, the nutrition and moral condition will be improved, and they will become good citizens if you give them a chance to become such. We have been able to do this through the aid of the dentists only. We have been able to give this teaching to 234 different homes, and, as I said in the start, I am very glad of this opportunity to appear before you here before your state society and to say to you all, representatives from all over the state, how much we appreciate in Detroit the good work that has been done here by your District Society. It was one of the few instances where the co-operation in the work of preventive medicine in any line came from a society without our going after it, and came absolutely. They did not say, "now we are going to do so and so, and we want to be the whole thing, and we want it distinctly understood that the dentists are improving the condition of the school children," but they came and said, "if you will undertake to improve your system of medical inspection of schools by adding to it a special inspection of the teeth, and let us do any work that we can to help you, we will furnish you everything." The result has been that we have started this thing and it will grow until public sentiment gets so strongly back of it that the men who have the coffers of the city cannot stop us from going on with this work. We have insisted on having the preparations made which will provide a clinic in the Board of Health building, fitted for the purpose. That means that during next year there will be two clinics, as I am informed by your committee here that Grace Hospital wants that clinic continued up there. That means that for another year we will be compelled to call upon the District Society to keep on helping us the way they have been doing. By that time I am sure, on account of the work I have detailed to you today being increased two-fold or ten-fold, people will stand up and realize what it means, and then they will probably stand for it as far as the expenses are concerned. It would not be fair to expect the District Dental Society to continue this indefinitely, as far as going down into its pocket. It certainly is a great work and is very far-reaching, and it means a good deal. I was reading, only a few days ago, a reprint of a paper delivered by Dr. Egbert, of Philadelphia, at the American Medical Society which met in St. Louis last week. In that paper he quotes Dr. Osler, whom we all respect very highly, and says that Osler has calculated carefully that there is, in New York City, on account of the lack of medical supervision of educational work, an annual financial loss of $1,666,666. So much for the dollars and cents value of medical supervision of educational work. Osler also made the statement that he considered it of greater importance to the nation that the question of sound teeth be intelligently considered than that the consumption of alcohol be restricted.

ABSTRACT OF DISCUSSION.

Dr. Bowles, Detroit: I have made a note of a statement you made, Dr. Kiefer, and want to be sure that I have it right, because if I am correct it is of very vital importance to us. It is, "That the work done by the dental clinic is more far-reaching than anything done by the Detroit Board of Health."

Dr. Kiefer: "Than any other one thing."

Dr. C. G. Bowles: I think the public will hear from that statement some time in the future. That is far-reaching, and to come from the Board of Health, it is good. We dentists have long felt that that is the case. We have held that malnutrition was at the bottom of a large percentage of cases of bad health, retarded mental and physical growth, and stunted morals as well. We think that if a child does not masticate its food malnutrition must almost inevitably follow. Dr. Kiefer's official and public recognition of this truth is of very great importance and encouragement to us. I have attended a number of meetings where physicians have discussed the examination of children, but this is the first one where I have heard reference made to the teeth. They call attention to adenoids, and defective ears and a thousand other things, but physicians as a class, know absolutely nothing about the teeth. They examine the tongue, on three sides of which are broken down teeth, and pulp conditions that in the eyes of the dentist are foul in the extreme, but the physician has no eyes to see these things. I am glad, indeed, that Dr. Kiefer has emphasized this fact. I want to make a suggestion. That is, that when he makes his report to the Health Board and when he addresses physicians or the public generally that he will emphasize this point—that defective teeth are among the first of the child's physical defects requiring recognition and correction.

DR. N. S. HOFF, Ann Arbor: This is a most intensely interesting subject to me and one that I think ought to be interesting to all of us, and I have no doubt it is. It seems to me that we are just on the eve of one of the greatest and most progressive eras that our profession has ever known, and I confidently expect that we are going to do something promising. We are now getting the co-operation of the medical profession and the health authorities of the country, as never before, and we are doing a work which I think is certainly fundamental. The surprising thing to me is that we have not done it, long before this, but circumstances seem not to have been right for it until now. I have come to the conclusion since I have been engaged in this work, and for the last three or four years that I have been studying this problem, if it were possible for us to take children at the youngest possible age and begin systematically preventive treatment, in regard to their noses, throats and mouths—the nose and throat by the physician, and the teeth by the dentist, that we could do more for our generation than has ever been done by all combined efforts in medical hygiene and medical science in the betterment of our efforts in this direction, simply for the reason that it is fundamental, that if we can give children plenty of fresh air to breathe, and if we can give them teeth to eat their food with, why should not we by that means build up constitutions that will make it possible for them to avoid a great many, if not a large majority, of the diseases to which children are subject. If we can do this thing at the time when they are developing their bodies physically, it follows that they would have strong physical constitutions, and it stands to reason that these children would not have to go through a regular ordeal of children's diseases such as is expected of every child, such as scarlet fever, mumps, measles, chicken pox, and all other child diseases. Parents take it as a matter of course that children must have these things. It seems to me that there is no reason why children should be subjected to these diseases, and it seems now that we have now found a way in which this thing can be prevented if it is possible to practically put it in operation. I don't see why this preventive treatment is not possible and practical. I believe confidently, from the experience I have had in the last three or four years in dealing with this problem, that we can absolutely prevent not only dental caries, but all diseases of the gums. There is no reason why we should have pyorrhea as a disease of the mouth any more than some specific disease of the mouth, and it is a disease which can be wholly eradicated by proper attention, and it seems to me that nobody else can do this except the dental profession, and if we can have the co-operation of the medical profession in taking care of our youth, why should not these children develop into practically perfect specimens of humanity? This is the problem we have before us today and with our orthodontists and dental hygienists and rhinologists and the consent of parents we can put the children in a way to assimilate not only the air they breathe but the food they eat. What more can we ask? It is fundamental. This oral hygiene agitation that is going on all over this country is a thing that I am somewhat afraid of, because it looks to me as though we were agitating the problem before we are ready to take care of it, but if we can by this agitation interest the public and the medical profession we should be able to enlist our profession, without which the whole effort must fail. If we are willing to make the sacrifice and do the duty that is before us, we cannot only take care of our private patients in a proper way, and we can bring up our children in the proper way and do a benevolent work second to no philanthropic work I know anything about, and I have kept in touch with benevolences of various organizations all my life. It seems to me that it is the greatest and the noblest work that anybody could engage in. I would rather today give my time and attention to this work than to go to the best missionary field in the world and with the biggest promise in it.

I have on the screen here a tentative sketch, or study plan of a hospital that is to be built in Boston, sent me by Dr. Williams, Dean of the Tufts Medical College, who is one of the Board of Trustees which has this matter in charge, and he asks for suggestions as to the dental equipment to be put into this building. The infirmary is to be devoted to the treatment of teeth alone. On the second floor there is room for the surgical treatment; also a school room, where children are to be given instruction in oral hygiene. Dr. Williams told me he thought in all probability there were 100,000 people tributary to Boston who could not afford a dentist that they would have to serve, and he showed me a picture of the infirmary in Tufts Medical College Dental Department crowded full of children that had come there for treatment, that they could not possibly handle, and that is what drove them to make this building. Mr. Forsythe has given a large amount of money, paid $100,000 for the property, proposes to put up this building and provide for its maintenance in a general way, though he expects the co-operation of the medical and dental profession in order to carry on the work. The field is, perhaps, greater than in Detroit, but the field is everywhere, just as important. Our poor children need this treatment just as much as they do in Boston. I am watching this movement with much interest. It is a forerunner, if it is successful, of a general campaign throughout the United States. If we can get the co-operation of the medical profession and moneyed people in the country who will support this thing in a financial way, doesn't it look as though we were on the highway to prosperity in the successful handling of this very difficult problem?

DENTISTRY FOR THE MASSES*

By Sidney J. Rauh, D. D. S., Cincinnati, Ohio

IN a paper published in January, 1905, "Six Years' Work in Oral Prophylaxis," by D. D. Smith, D. D. S., M. D., of Philadelphia, Pa., he aptly presents the necessity for what we may term "Sociological Dentistry," although discussing prophylaxis in private practice.

The greatest sanitary reform of the world lies in the herculean task of revolutionizing the unsanitary and infectious conditions of the human mouth. Contagion and disease are subtle and dangerous, for infection in the human mouth is found in all places where humanity dwells.

To "the masses of the people" dentistry of the present extends no benefits, it presents no hopes, it affords no relief, save in one direction—that of ridding the mouth of aching teeth through extraction. "The mass of the people" are not instructed respecting the teeth; they are wholly unacquainted with the necessities, requirements or value of these organs. How, then, should they be expected to follow out any theory or give attention to the details of any "system," for their betterment or preservation?

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*Read before the Kentucky State Dental Society, 1910.

When instructed, patients have been quick to see and appreciate the imminent danger of systemic infection due to septic states of untreated teeth. A set of septic teeth, ordinarily presenting a surface of twenty to thirty square inches in the oral cavity, a cavity which has been aptly designated "the vestibule of life," is a perpetual menace to human health.

No adequate consideration has ever been given to the sources of infection inherent in the human mouth, consequent upon the presence of natural teeth. The adverse local consequences—decay, alveolar necrosis, pyorrhea, gum recession and final loss of teeth—are as nothing in comparison with the evils to be revealed in the systemic disturbances and diseases which result from the continuous state of infection found in association with the teeth in the human mouth. These conditions, studied by dentistry and intelligently set forth to "the mass of the people" would find a "receptiveness" which would render incalculable benefits to general health, longevity and happiness of all civilized humanity.

It can only be done by a process of education, and that through instruction given by dentistry. Every dentist should first inform himself and then fully instruct individual patients in the details of the care of the human mouth. The people should be taught that cleaning the teeth is not merely the possession of a tooth brush. The best-shaped brush in the world will not clean the teeth in a human mouth unless it be intelligently used.

The secrets of tooth decay, in and of themselves, are of minor consequence in comparison with the systemic infections due directly to states and conditions of the teeth in the mouth. We venture to predict that recognition will ere long be made of the fact that tuberculosis -that decimater of homes—and possibly other grave chronic disorders can find no soil for development in a system kept from the contaminations of mouth infections through a rigorous prophylaxis treatment from childhood.

We have abundantly proven that diabetes and many gastro-intestinal troubles are directly traceable to the mouth infection of alveolar pyorrhea; also that many pharyngeal and tonsilar inflammations and many skin troubles have their origin in infection in the mouth, due to septic states of neglected teeth. We know, also, that mental depression and hypochondria and many of the perplexing nervous conditions in women, result from the same cause."

When the writer first considered the idea of presenting a paper upon this subject about one year ago, there seemed to be a lack of enthusiasm upon the part of the profession as well as the laity. Within the past few months there appears to be an aroused sentiment which augurs well for the movement. Some of the most prominent men in various centers are promulgating the "new creed of dentistry" and the subject which has been almost entirely theoretical has developed into an essentially practical one today. The dental literature is full of matter pertaining to it. No later than in the October *Cosmos*, a most excellent editorial appeared in which interest in the movement was urged. In many of the larger cities medical examination of school children is an accomplished fact, a great many of the school systems in these cities having special schools for so-called defectives. Modern educational methods recognize that in order for a child to do efficient work, his physical make-up must be normal. In many of the cases the defectiveness is remedied by the removal of the cause of disease. The particular causes are adenoids, enlarged tonsils, other defects of the throat, defective vision, tuberculosis and kindred diseases of civilization and in a great many cases DEFECTIVE TEETH, causing stomachic disorders and the numerous complications from lack of proper digestion. It is scarcely necessary, before a dental society, to further call attention to the necessity for this class of work and we shall assume that there is no doubt in the minds of the profession of its urgent need.

In the September *Brief* the statement is made that only about 6,000,000 people have their teeth periodically examined and the necessary work done, less than 8 per cent. of the entire population. If this be true, and there is no reason to doubt the statement, it will open up a field for dentistry in this country which has not been realized. There are approximately 30,000 dentists practicing in the United States and it can be readily seen that this is not an adequate number, therefore, if the work can be carried on, it will not only be a blessing to the laity, but to the profession as well.

Several times, in various articles, attention is called to the fact that advertisers are probably receiving more than their proportion of the dental practice, more especially of the poorer classes. Why should this be? In our opinion it is due to the fact that the people do not realize the importance and necessity for dental treatment and only when they are forced to do so, is their attention attracted to the defects in the mouth; naturally, they drift to those places which are brought to their attention. It must be our duty to educate them and this means not only the poorest classes, but the great majority of people who can readily afford to pay for service.

The Principal of the Sixth District School of Cincinnati, where a dental examination was made last spring, makes the assertion that probably 25 per cent. at least of those examined could afford to pay for service and less than 5 per cent. at that time had availed themselves of the opportunity. This is in one of the poorest districts in Cincinnati and the proportion of those who can afford to pay would be greater in the more prosperous communities. In the Avondale School, situated in the best section of Cincinnati, at our recent examination it was found that 298 children out of a total of 561 examined had mouths that were well cared for by dentists. At the time of this examination a great many children were absent, so we have no doubt that this number would be increased. In other words, over half the children in this school knew the value of dental service; a most striking argument in favor of dental education.

The work may be instituted through the existing dental organizations, along the following lines:

First:

INSTITUTIONS

All private, municipal, state and federal organizations such as houses of refuge, the various prisons, orphan asylums, etc., should employ special dentists either with or without remuneration as the exigencies of the situation demand. This part of our propaganda is simply one of educating those in charge of these institutions to a realization of the necessity for the work. Last year we had the opportunity of addressing the children of the House of Refuge at Cincinnati and the Superintendent informed us that the only dental service performed was the occasional extraction of a tooth by a dentist of the neighborhood who had volunteered his services. Is it not as necessary for the state to take care of the mouths and other bodily defects of its dependents as well as of their education? We are pleased to state that every child in this institution is required to use the tooth brush at regular set times each day and the arrangements for caring for the brushes are adequate.

Second:

POPULAR TALKS TO THE PUBLIC

That a great deal can be accomplished by this form of education there is no doubt. That the opportunity exists for delivering these talks only requires the willingness on the part of the profession to do the work, to realize. There has been an insistent demand in our city for lectures from Social Settlements, the Mothers' Clubs (which form a part of the Kindergarten system in the Public Schools), so-called Parents' Clubs, Courses of Lectures on Hygiene, in fact, within the past year we have probably been called upon to deliver over 50 lectures. The Odontological Society of Cincinnati has recently appointed a regular committee for the purpose of doing this work and some 15 men have volunteered. The slides, which will be shown, are the basis for the lectures and certain rules must be observed in order to attract and impress your audience. About 30 minutes should be the limit of a talk for if you go beyond this time, one is apt to become technical and dip too deeply into the subject, thereby losing the effect of impressing his auditors with the two main points—necessity for adequate brushing and the restoration of the mouth and teeth to a hygienic condition. Miss Bothwell, Superintendent of Kindergartens of Cincinnati, offers the following report, which is self-explanatory:

Dr. Sidney J. Rauh,
31 E. Fourth Street, Cincinnati, Ohio.

My Dear Dr. Rauh:—In behalf of the Mothers' Clubs and the Kindergarten Directors of the Public Schools I wish to express our cordial appreciation to you and to Dr. Fletcher, Dr. Schott, Dr. Beard, Dr. Germann, Dr. Clawson, Dr. H. T. Smith, Dr. C. Stanley Smith, Dr. Stacy, Dr. Harcourt, Dr. Mallett and Dr. Zeter for the lectures given during the school year of 1909-1910.

They have been of much service in helping to bring the mothers to the consciousness of the great need of the little child for right physical care.

With the hope of being able to furnish an approximate estimate of the practical results I asked the Kindergarten Directors if it would be possible to obtain statistics of the number of children who had been taken to a dentist or who had been provided with tooth brushes since the lecture. The Kindergartners were unanimous in their objections to asking such personal questions of the mothers. They were equally unanimous that the lectures had been worth while and are eager for another course for 1910-1911.

I personally know of one kindergarten where a large proportion of the children and many mothers have received dental care since the lecture was given to the mothers.

The total number of people attending the lectures is 678—and it is safe to estimate that a report was given to as many more who did not attend. The Kindergartner has discussed the lecture in her visit to the homes and has talked with the children in kindergarten about the necessity and the proper way of brushing the teeth.

If the Dental Association of Cincinnati will aid us in this good work again—we would like to have lectures given next year in the following places:

The 12th District Jewish Settlement, Avondale; 6th District; 15th District, Jackson; 1st District, Sherman, Garfield; 18th District, Hyde Park; 28th District, and Vine Street School.

Trusting that you will consider this work worth while and with many thanks for your co-operation of the past year, I am Sincerely yours,

JULIA S. BOTHWELL, *Supervisor of Kindergartens.*

Third:

PUBLIC CLINICS

The colleges are undoubtedly doing good work; it is manifestly impossible for them to treat all indigent poor without pay. District physicians are a part of the municipality as much as any other branch of the city government. District dentists must be the next step. At first it might be necessary to demonstrate the feasibility of this idea by the employment of only a few men. The results following the restoration to the normal of the mouths of the children of a room in school would be sufficient to impress upon all the necessity for the work. At present we are organizing a Free Clinic in Cincinnati, to be supported by voluntary contribution. We are asking our local society for a contribution of $500.00 and by a strange coincidence that request will be acted upon today. In addition to this, we have collected over $1,000.00. We estimate that this clinic will cost in the neighborhood of $2,500.00 the first year. This will include the equipment, the employment of at least one paid dentist, an assistant who shall do the clerical work. The clinic must be run along strictly ethical, high class lines, with the best equipment possible to be obtained, for if the work is to be educational, too great stress cannot be put upon CLEANLINESS and no lesson is so impressive as that which is seen by the eye. We do not believe that all children in a city as large as Cincinnati can be treated for this sum, but certainly the schools thus far investigated can be so handled. In the

April number of the *Dental Cosmos*, an article by Dr. Wm. W. Belcher is well worthy of your attention upon this subject. I quote his expense account:

Rent of rooms, heat and light	$ 200.00
Services of assistant	364.00
Salaries of dentists	1,200.00
Linen	24.00
Materials and supplies	300.00
Incidentals	100.00
Total	$2,188.00

Fourth:

SCHOOL EXAMINATIONS

As a purely experimental proposition, the mouths of 920 children of one school in Cincinnati were examined. The results will be shown to you upon several of the slides. Dr. Ebersole, of Cleveland, has provided the following figures for me, the result of a similar examination held in Cleveland in June, 1909:

Number examined	Requiring attention	Number of cavities
864	92.8%	3920
691	97.0%	4494
298	95.3%	1342
824	98.4%	5505

In an examination in one of the Detroit schools the following was furnished the writer by Dr. Zederbaum:

Number examined	Requiring attention	Number of cavities
305	98.6%	1334

In 1909-1910 we have examined nine schools, a total of 5,514 children. We found 958 to have no defect, making about 85% defective. However, had these examinations been more thorough and more especially if all those children without permanent teeth had been excluded, the percentage would have been much higher and we believe that the figures brought out in another part of the essay, about 90%, is the correct average. In the First Intermediate School, where the youngest child is 10 years old, the figures are of special interest, 905 were examined and only 71 had no defect, making an average of 93% defective, thus proving the above statement. There were 10,906 cavities in the first molars, surely enough to keep us busy for some little time. Further figures will be shown upon charts upon the walls and with the slides.

From the experience gained in these examinations, we should say that with adequate assistance, one man can examine 30 or more children per hour, or 100 in an afternoon. Therefore, if six men volunteered for a day, almost any school could be finished within two days.

After the examination, cards must be sent to the parents of the children and a "follow up system," which consists of having the district nurses investigate the case and explaining the necessity for the work wherever it is considered expedient, and this, with public lectures, will dispose of from 15 to 25% of the cases by receiving dental attention of their own accord, then there are a certain number who do not require immediate attention, so that the free clinic work would not be as great as would appear upon superficial examination. Cards were sent to the parents of all the children following one of these examinations, at a very inopportune time, and still the principal reports this result, which should certainly encourage us to proceed:

52 children had 80 teeth extracted.
16—cleaning by dentists.
26—had 61 fillings and 4 crowns inserted.

It is our intention to send a second card to these same parents and we believe that even a greater number will receive attention. The Free Clinics and District Dentists must take care of the rest. In the small towns the proposition should be a much simpler one and if the dentists of these communities would co-operate, their problem might be readily solved. The assistance of newspapers, magazines and other periodicals can easily be obtained by individuals interesting themselves in the movement.

If you will review the work done by the Anti-Tuberculosis League all over this country, if not the world, the result which can be obtained by arousing public sentiment is demonstrated.

The following extracts from the report presented to the Odontological Society of Hamilton County, may serve as a basis for similar work in other places, as well as a means of rectifying mistakes which have been made through our inexperience, by bringing about a discussion:

"The work accomplished by the committee, assisted by the members of the society consists of the examination of the children of the Sixth District School, which is located in one of the poorer sections of the town; the pupils represent almost all nationalities, a great many of whom have only been here a short time. The examination was conducted in a methodical manner with the hearty co-operation of a great many of the members of our society and also with the assistance of the nurses of the Medical Examination Department and a number of volunteers."

"Some of the questions asked were not properly answered, which accounts for a seeming disparity: for example, the one of cleaning teeth—414 answered yes and 509 no, but from our experience we should judge that over 850 children did not use the tooth brush at all."

"In the detailed report presented herewith, you will note that 10 children at the age of 15 were examined in which 25 first molar teeth were defective, and when you consider that some of the teeth had already been extracted, the percentage would be even greater."

"The plan adopted for the examination was to have an assistant for each examiner who did his clerical work, the card presented by the children being already filled out as to name, age, address, etc. In addition to this there were nurses who took charge of the children and also of the instruments. At the end of the examination held the first day, a talk was delivered to the teachers, who manifested considerable interest in the work and at the completion of the examination the children of the higher grades were addressed upon the same subject. The pamphlets printed by the Board of Education, under our supervision, were distributed that same day after a short talk by the teachers and in this way we think that a good campaign is begun. In addition to this, every child was given a slip which told of the special needs for his case and instructed to present same to his parents."

"The diagrams presented herewith (they will be thrown upon the screen) show explicitly the number of defects. In 920 children 2,034 first molar teeth were defective and when you consider that some of the children examined did not have their first molars, you will see what a terrific percentage it is:

250 second molar teeth defective,
150 central teeth defective,
81 laterals defective,
8 cuspids defective,
106 first bicuspids defective,
120 second bicuspids defective.

"The report shows that about 90% of the mouths were defective; 76 mouths were reported as irregular—but only the extreme cases were noted. Permanent teeth to the number of 112 were reported as missing, this being a most conservative number as undoubtedly in the haste of examination a number of cases were overlooked."

"As the result of this work your chairman was invited by Dr. Dyer, Superintendent of the Public Schools, to address the 'Teachers' Institute.' This was done in the early part of September, there being fully twelve hundred (1,200) teachers in the audience."

"Dr. Dyer, as well as Miss Bothwell, Superintendent of Kindergartens, especially requested that the Mothers' Clubs, thirty-eight in number, be the first to receive attention, and this suggestion has been adopted.

"We would suggest that a permanent lecture committee be maintained by our society, to be at the disposal of all organizations that wish to receive instructions on 'Dental Hygiene.' "

"The slides, which will be shown, can serve as a basis for the talk and the committee will assist any who feel diffident regarding public appearance upon the platform."

"Now what shall be done with conditions as indicated above?"

"The moral support of the Board of Education and of the Health Office we have already. But this is not sufficient."

"The ultimate goal of a movement such as this must be the employment, by the city, of dentists at a salary, to take care of the indigent poor. The province of our society from now on must be a concerted move to popularize this idea. This can be done by attending all public movements which have as their object the improvement of general hygienic conditions. If the city will not allow an appropriation in the near future, we would recommend that a private subscription be attempted with which to employ several dentists to do this work and in this way we can demonstrate the feasibility and necessity for the work. In order to do this it will be necessary for the society to give its hearty co-operation and for us to examine the mouths of the children of at least six more schools, beginning this fall."

"In addition to this, a score of men should be prepared to deliver lectures in all the schools, at least where these examinations are made. The slides which are shown this evening making such a talk a very simple proposition."

We would welcome any suggestions for the furtherance of this work and think this is the opportunity for our society to demonstrate that it is in the lead of a movement which is taking root in many of the communities of our country.

ABSTRACT OF DISCUSSION.

Dr. Eble: I believe that if we expect to get good results from this, our school children will have to depend upon us to instruct them on those practical laws of oral hygiene. Dr. Osler says that more people die from neglect of this kind than from alcohol. Statistics show that a person a minute dies from preventable diseases. The twentieth century dentist has to be not only an artisan but an artist. This wave of oral hygiene is becoming universal; it has taken such a hold upon the public. Especially is this so in Germany. It was insisted that a large part of the sickness in the German army has been caused by deficiencies of this kind.

Children have sometime to be taught like monkeys. You teach one child to brush its teeth and the balance will follow suit. You may have to watch them or they will get the wrong tooth brush. This wave of oral hygiene that is going on in Louisville has had a great many breaks; I see it right here in our midst. If we expect to make an impression upon the public at all we must teach by example as well as precept. Dr. Rauh has demonstrated the use of the tooth brush; I think the use of the brush should be demonstrated to our patients, especially to the younger ones. Nearly every day I make such demonstration and especially do I make this demonstration to children. We have recently made an examination of the teeth of three of the public schools of the city; one in the east end; one in the center and one in the west end of the city, in order that we might by this means get an average of the general condition of the teeth of the children. The number of the children examined at those schools (and I believe that will give us a pretty fair average of the condition over the city) was 1,364. We found that twenty per cent. of the mouths of this number were good and 80 per cent. fair and bad. Of the gums, 67 per cent. good and 33 per cent. fair and bad. The number of the children who did not use the tooth brush was 668; and as Dr. Rauh has said, you can always take it for granted that this does not cover the number. Many of the children said that they used the tooth brush when you could tell by looking into their mouths that it was an absolute stranger. The number of children having fillings were 449, or 33 per cent.; and the number of children who had no fillings were 779, or about 45 per cent. The number who had permanent teeth extracted were 236 or about 17 per cent. And the cases of malocclusion were 441. To make these examinations it required considerable work on the part of those who had this in hand to get the dentists to assist. Those men who were taking an interest in this and were willing to work, were afraid that they would be frowned upon and maybe their efforts would be considered in the light of advertising. Again in order to accomplish anything, it is necessary to get somebody to go before. We got behind our health officer. We started into this with a great deal of timidity. We wondered how we would be received. But I can say from experience that we were not only received but most cordially received. We had a great many obstacles to overcome. You know there was never a wise man who fell from the heavens. I believe our next examination will be better. We will be able to get the assistance of the thirty men who helped in this, and by co-operation we can better carry out the plan that has been outlined so beautifully by Dr. Rauh.

Dr. Dorsey: It is said that in every mouth there is about twenty-five square inches of surface to all the teeth. If there were twenty to thirty children in a school room which would mean 1,000 square inches of surface in that room which was 97 per cent. full of bacteria of all kinds. This unhygienic condition would not be tolerated in any other portion of the city. Especially when we know how injurious to health are these bacteria. Statistics show that 75 per cent. of cancer of the stomach comes from lack of proper care of the teeth. Speaking of the children in the city and the rural districts, I do not hardly believe that the per cent. of bad conditions will be as large in the rural district as it is in the city. This comes largely from the kind of food which the child eats; in the rural districts the food is seasonable while in the city it is not. In the city they eat that which is the most palatable and which is not always the most nourishing. One of the most necessary things in this education of the public is to insist on the care and preservation of the sixth year molar. To neglect this tooth means to mar the health and good looks of the patient. There are many here in this audience who would have looked better had this sixth year molar been retained to the proper time. If this work continues in the schools (as it has been started and is no doubt doing in the Cincinnati schools) it looks as if the per cent. would be about cut in half in a few years. To do this work though requires a great deal of time, as well as of determination on the part of those doing the work. In my locality it is one of the hardest things in the world. I have grown up in that section and the children all call me by name. I have taken the work up, however, in our public schools and have gotten things started on a satisfactory basis. One trouble I had was to get the school boards to make it compulsory that the children should attend school on the days the examination took place. In some places I see where the medical profession has gone so far as to have district nurses in the town who go after the examinations are made by the physicians, and visit the people in their homes and explain the conditions that have been discovered. Of course, our examinations are made very hurriedly and are not as accurate as they could be. No doubt but that the per cent. would be larger if they were made with greater care. I think it would be well to have a series of lectures arranged for the trained nurses of the city and country. They are in position many times to have to care for the mouths of their patients, and in most cases, they know very little about it; even how to care for their own teeth; much less to instruct others in the care of their teeth.

Dr. E. D. Rose: It is not necessary in doing this work for everyone of us to try to do it just like Dr. Rauh. Over in Bourbon county every child in the public schools is receiving instruction in the way that Dr. ——— thinks best. In Warren county the same thing is true. The people there do not know when it started nor where it came from. The Bible says that you must not let your right hand know what your left hand is doing. Things are so arranged that every child as soon as he comes into the school is examined and a report sent back to the parent that night. I take my hat off to Dr. Rauh; and, like Bob Taylor, I take it off twice to Dr. Fletcher. In regard to tooth brushes, I do not see why they are made with the tufts and hook at the end—it is most unnatural and irritating. I think the use of wrong kind of brushes, used in the wrong way, is the cause of much receding of the gums. It is said that 8 per cent. of the people of the United States use a tooth brush. If you were to examine this 8 per cent. you would find that 4 per cent. of that number were worse off than if they had not used one. A tooth brush used to excess is worse than one never used. Just before retiring is the best time to brush the teeth, the wounds heal during the night. Dr. Miller has written one of the best articles I have read. He says that a very large per cent. of the people in Germany or England, or somewhere else, were using Lyons' tooth powder. That he could brush in sixteen hours steadily on one spot of dentin with this powder and at the end of that time have gone entirely through the dentin of the tooth. I believe practically all tooth powders should be discarded. The dental floss is good in many instances if it is used right; if not it had better not be used at all.

Dr. Meguiar: I believe that the secret of the tooth brush is the massage it gives from gently gliding over the gums. I do not think it is necessary to irritate the gums. The savages had good teeth and they possibly never used a tooth brush. The stimulation the gums receive from the motion of the brush has a tendency to strengthen them; if you have healthy gums you are very apt to have good teeth.

Dr. Logan: In reference to the examination blanks used in these examinations, it seems to me that it would be well never to have the dentist's name upon the blank that is to be returned to the parent of the child. That mistake might be made: if I were examining some patient of yours and he should take the slip home he might think that I was a better dentist than you because I was examining in the schools. We have also made it a rule in our city never to let a man examine in the locality of his home or office. I might drop some remark that would influence that child to want to come to me. For that reason it would not be right for me to examine the teeth of the children in my locality. Second, we must find out the exact condition of the children's teeth and what there is to be done. This is what they are doing in Dr. Rauh's town. They are going to get a free clinic to help correct these troubles that they find. I hope that you may do the same thing in your town. If we start this work and do not keep it up it will hurt us more than if we had never undertaken it. The thing I think would go far towards arousing an interest in this work throughout your state would be for your State Society to have a hundred slides, similar to the ones presented tonight, telling what the conditions are, how they occur and how they may be prevented. Let your secretary have charge of this and send them out over the state where they may be most needed at some time that may be arranged for that purpose.

And the thing we should try is to interest our government in this question of oral hygiene and have them care as much for our boys and girls as they do for the trees, the game, and the hogs of our country. If hog cholera makes its appearance in any section every precaution is at once taken, no matter the expense, to stamp it out. We should show them how great the need is for the proper care of the children's teeth. We have free hospitals for the care of the bodies of the poor; we should also have free infirmaries for the proper care and preservation of the teeth and gums.

I have always been wont to look upon the south as a land where the cotton whitens beneath the moon and stars; a land noted for her natural resources, and especially for the loyal and genuine qualities of her men. What is true of her social life is also true, I find, of her professional life. I have never found a more loyal body of professional men than I have found in the state of Kentucky. I am very glad to have been with you at this meeting.

Dr. Tileston: Dr. Rauh has certainly given much time and interest to this work. There are not many men who are willing to make this sacrifice. He certainly deserves our respect and appreciation. I realize what an undertaking we have on our hands in starting this work, and like Dr. Logan, I contemplate the danger it would be to our profession should we not carry it out. It is a tremendous undertaking. It will be a great blow to our profession should we assume to do this work and fail.

In making these examinations, I think Dr. Logan is right in not having the name of the dentist on the blank sent home to the parent. We used our initials on them. We first thought of using numbers, but on account of there being so many, we thought this might be confusing. We made no attempt to use the explorer in the mouth; in fact, one of the things we insisted upon was that no explorer should be used. We got our hints from the Cleveland schools. The purpose of our examinations was to simply call attention to the necessity of something being done. We are not starting out with the idea of having a clinic at our own expense. What we want is to have the public officers see the necessity of maintaining a free dental clinic for the poorer children of the city.

DR. RAUH: In regard to the fear of our getting a little free advertising in this work, I would say, keep your name out of it if you possibly can. It will creep in, though, if you are active in the work. You cannot help that. Where it is not possible to keep it out, I let the matter alone.

PRESIDENT'S ADDRESS

By H. C. Sexton, D. D. S., Shelbyville, Ind.

ON this, our 52nd annual meeting, we, the dentists of Indiana, find ourselves facing a future of remarkable possibilities. In the last few years the world of dentistry has been developing and broadening by leaps and bounds. This is shown not only by the amount of dental work doing over the country, but it is shown in even more striking manner, both in the attitude of the dentist toward his work and in the attitude of the public toward him.

As regards the amount of dental work, undoubtedly it has increased in the last ten years fully one hundred per cent. A decade ago the dentist was merely a professional man whom the great world, except in moments of distress, overlooked completely. In the great movements going on in various directions for the amelioration of the condition of the human race, the dentist was not an actor. Medical societies, health boards, charitable organizations, educational institutions, were doing grand work. The dentist, unconcerned, moved along in the little groove past decades had prepared for him.

Today we face a different situation, inhale a different atmosphere. Signs of professional activity are about us in all directions, and when I say professional I mean activity that has as its aim an ideal higher than anything we have hitherto experienced. Instead of being today a mere repairer of the ruin he finds in many mouths, the modern dentist has evolved or is evolving into a teacher—a teacher of cleanliness, a teacher of prophylaxis, and is thus becoming more truly a professional man.

The art of dentistry in the last few years has made remarkable progress, but the profession of dentistry has made more. As an art dentistry can save many a broken down, painful tooth and supply many an edentulous mouth with a useful appliance; as a profession dentistry can do even more it can prevent those teeth from becoming broken down, it can save that mouth from becoming edentulous. The dentistry of the future will be better than the dentistry of the past, in that the idea of prevention once thoroughly conceived, will grow and grow with the years. To cure is good, but to prevent is better.

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*Read before the Indiana State Dental Society, 1910.

And so it seems to me that we dentists are better professional men today than ever before. We are better professional men because we are becoming teachers, teachers of cleanliness, teachers of advanced civilization.

Let us take some few minutes of our time in consideration of this matter of cleanliness.

It has long been a favorite theory of mine that the advance of the great human family toward civilization is, after all is considered, merely an advance in cleanliness. From savagery on to the enlightenment of the present day each step in advance has recorded increased cleanliness of the person and increased cleanliness of the home.

As you take a long sweeping view down the history of Europe and at each period note the most cleanly nation, invariably that most cleanly nation is found to be the most prosperous, the most civilized one. You find also that the decadence of that nation and its fall from power is coincident with its wallowing back into the slough of uncleanliness.

A short review of this subject and the lesson to be drawn from it is, I believe, very apropos to us dentists at the present stage of our development.

For instance, consider the Greeks in the heroic period of their history with their teaching of the all importance of the body divine and their Spartan care and development of it. They then led the world. This country, although but a little backyard of ground, was the center of the civilization and advancement of mankind. And their leadership continued just as long as their high ideals lasted. When later they bent the knee to degenerate and unclean philosophers, then came their loss of power and prestige. They fell to the rear.

This picture also holds true of the Romans. In the heroic age of Rome, cleanliness of the body was typical of the nation, making them a race apart from all others. The great baths of old Rome are still written of and admired. These houses devoted to the God of Cleanliness were among the most sumptuous, most imposing structures of the age. Later when came the fall from power, it came through the adoption into her body politic of great masses of the unwashed foreigner.

After the heroic age of Rome, Christianity came to the fore. We have stated that increased cleanliness always meant advanced civilization. The reverse is also true. Diminished cleanliness means retrogression—the sliding back into the slough of darkness. Let us judge of the effect upon civilization of this new force in the world by its immediate effect upon cleanliness. Did Christianity have a tendency to counteract the uncleanliness of the northern masses that flooded Rome? I am sorry to say it did not. The pagan ideal had been cleanliness and so in pure opposition the new religion set itself against it. Early Christians were told that the soul alone was worthy of consideration, that care for the body was unworthy of them. The body as the abode of the devil was to be mortified. Pagans had exalted the body. Early Christians neglected and despised it.

For hundreds of years baths were unknown and to carry about with them vermin galore was but the common lot of mankind, from the greatest queen to the lowest villain. As an instance read the history of Thomas a Becket, now St. Thomas of Canterbury. For two years before his death he wore without removal a hair shirt sewn on. What lived under the shirt of that great cardinal, one of the richest and most powerful men in Europe, can be better imagined than described. By so living he thought he was glorifying God, and the opinion of the world at the time supported him.

But we were going to make an estimate of the state of civilization during the middle ages from its condition of cleanliness.

We have seen that the ages following the downfall of Rome from power were most uncleanly. Then we are to expect retrogression and benightment. And we have them in all their horrors in what historians have dubbed the Dark Ages. For hundreds of years civilization was lost sight of—uncleanliness ruled the stage.

And this uncleanliness almost lost the continent of Europe to Christianity. Over in Asia arose a more cleanly religion—Mohammedanism. Part of its creed was the daily bath. Then cleanliness fought uncleanliness. Before the end came the Arabs ruled Asia, Africa, Turkey in Europe, and all of Spain. Their intellectual dominance was even more remarkable. All the noted scientists—mathematicians, astronomers, physicians—were Arabians. They were the learned men of the world.

Europeans did not adopt the religion of the Arabs since they were gradually evolving a better one of their own, but they did adopt things more valuable. The Arabian system of counting for one thing; the cleanly, removable, often washed underclothing for another.

To come down to modern history, what country has made a more remarkable record for its size than that wonderful little bit of submerged land called Holland? And who can say just how much of this has been achieved because of their cleanliness, proverbial the world over? Cleanliness always bespeaks health, energy, vitality.

We Americans are today, I believe, one of the most cleanly of nations and consequently we occupy the outposts of civilization. The idea of the connection of filth, disease and degeneration is strongly entrenched among us and likewise do we associate together the ideas of cleanliness, health and advancement.

But we have not yet reached the Ultima Thule of cleanliness. We have, in fact, an enormous country before us still to conquer. The extent of it I believe the dentist can more fully realize than any other.

We, today, read of St. Thomas and his hair shirt and shudder. In centuries to come more civilized people—which is equivalent to saying more cleanly people—will read of the neglect of the mouths of the present age and shudder. In oral cleanliness the mass of the people of today are still in the Dark Ages. Not over ten per cent., it is stated, use a tooth brush even once a day.

In the work before us—in the driving of this God of Uncleanliness from the oral cavity, we dentists must be leaders, must be preachers. We must stand before the public and proclaim everlastingly that the only salvation of teeth is cleanliness, that a clean tooth cannot decay, that cleanliness is not next to godliness, but cleanliness is godliness, that one of the very best ways to worship God is by taking care of, developing, bringing to perfection, and saving from caries and putrefaction, this body that He has given us. In this application of cleanliness will come the next great advance of our profession.

How this education can best be accomplished has caused much discussion. Though we may not yet be united on the one best way there are many ways all acknowledged to be good and we should not hesitate about getting into the great work. A few words to a careless patient when in the chair may prove seed sown on fertile soil; talks before school teachers and school children are wonderfully efficacious; dental inspection of schools is a grand work; free clinics for the indigent will come in time; all these are meritorious. And along with the education of the children, the teachers, and the public let us not neglect the education of ourselves. To preach hygiene we must practice hygiene. If the looks of your office, the surroundings of your chair, or your own person, particularly the condition of your own mouth and hands belie your words, you may be sure the seed will fall upon barren ground.

Let us look forward to the time when one will be ashamed to say he has carious teeth because all will know such a condition is produced by sin alone—sin against the law of cleanliness, the law of health. This is a high ideal, but not an impossible one. Let us hold such an ideal in our minds. Let us think it, and act it, and talk it, and live it. In the end the ideal will be realized. It must come.

As for the business immediately before our association there are only a few things I would mention.

In regard to the proposed new constitution laid over from last year—I doubt the expediency of its adoption. It seems to me to be a most complicated affair to be adopted in our state of local and district societies with no codes.

Some features of it, at least, I should like to see altered. For instance, I think it a mistake to make the secretaries of component societies collectors of the dues to the State Association. In the first place one man who is the right kind of man, will do better than thirty or forty men scattered over the state and dividing the responsibility until each will feel that it matters little whether his end of the business is attended to or not. Then, secondly, and this I think a stronger reason than my first, I do not believe the members of the Association who are unable to attend the annual meeting should be assessed for the expenses. This would be an innovation which in my opinion would be unjust and it would undoubtedly injure the association, which is not a money-making institution nor should it be. The attendance gives us ample funds to meet expenses. What more should we desire?

The date of our annual meeting should be during that week in May which least interferes with the meeting of the associations of adjoining states. This year the Illinois State meeting is on the same days as our own. This is unfortunate and in the future should be avoided.

Last year our secretary was instructed by the Board of Trustees to secure from each member a historical record. In compliance with this he sent to each member such a card to be filled out. One would think the members of our association would take such pride in their membership that they would gladly help in this work. Yet our secretary reports that only half of them filled out and returned the cards and thereby he is greatly hampered in his work. Surely this should be remedied. Let those who have been remiss neglect it no longer. Our secretary is such a one as few dental associations are happy enough to possess. His position is a trying and laborious one and he is deserving of all the help that can be given him.

Now, in conclusion of this rambling address I wish to speak of a matter which on a previous occasion I advocated before our association.

It is my belief that for the good of the young dentists, for the good of the profession, and for the good of our association, the graduate just beginning practice should be at once affiliated with a professional society. Yet, not one in a score does so affiliate himself, and when not done at the beginning of his career it may be postponed for years and in many cases is never done at all. The objection urged by them is the expense. Most of us in looking back on the same period in our own lives will acknowledge the truth and the force of this plea.

Now, what I should like to see is a provision in our new Constitution and By-laws admitting all graduates of colleges within the state to membership in our association free of all cost for the year, if application be made by them at the annual meeting of the same year as their graduation. This inducement I believe would be appreciated and would result in great good both to the association and to those who in a few short years will be the main stay and backbone of our profession.

For the honor of being selected president of the Indiana State Dental Association I want to thank you. If I can see this recommendation regarding new members adopted during my incumbency I shall feel that, whatever other mistakes I have made, I at least will have repaid the association to some small extent for the trust reposed in me.

No man need fear that he ever will be hurt by falling upon the corners of a square deal.

DENTAL LAWS*

By Alphonso Irwin, D. D. S., Camden, N. J.

INTRODUCTION.

THERE are four hundred and sixty-eight colleges in the United States, including fifty-two dental colleges. They are doing a stupendous work in a magnificent manner. But grand as are the achievements of our American educators, greater still are the conquests yet to be made in the arena of learning, and the way to make the future of education more brilliant than the past is to remedy some glaring defects, which we regret as much on the one hand to refer to, as we glory in our educational system on the other. Place Ann Arbor by the side of Oxford, Harvard by the side of Cambridge, Pennsylvania alongside of the University of Edinburg, Northwestern beside the University of Berlin, Vanderbilt with the University of Utrecht, California with the Imperial University of St. Petersburg, University of Minnesota with the University of Leipsic, Iowa alongside of the University of Heidelberg, and our boasted universities dwarf by comparison. If our institutions suffer by comparison in the minds of Americans, is it any wonder that foreigners hold our colleges in slight esteem, or that our authorities should deem it wise to establish laws providing for the examination of these schools and policing the avenue of entrance into ALL our professions?

The effect of the American system of dental education is to produce fine operators, clinicians and mechanical dentists, who are sadly deficient in literary, scientific, medical and surgical training.

The entrance requirement in foreign universities is more exacting, particularly in regard to literary ability and the maintenance of standards of examinations are observed more rigidly, resulting in producing men better educated theoretically at least. *Coincidentally* the same discipline is observed in the requirements of the dental laws of nearly all the European countries that is enforced in the great universities. The result of this condition of dental *affairs* is two classes of dentists, namely the professional or licensed dentist and the mechanical or non-licensed dentist. Precisely the same distinction that we have in America, only the breach is wider between the two classes in Europe, because the licensed man must have a literary, scientific, medical and surgical, as well as dental training.

Without laws education would be impossible. Conversely, the adoption of wise laws and their judicious enforcement are dependent upon education. Law and education are so related and interdependent upon each other, that the one cannot flourish without the other. Law and education are the steeds harnessed to the chariot *civilization*; upon the speed and skill with which they are handled depends the race for the supremacy of a nation. Therefore, the consideration of the subject of laws involves the consideration of the subject of education, so that in the intelligent discussion of the subject of dental laws we must of necessity allude to the system of dental education.

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*Read before the Michigan State Dental Society, 1910.

DENTAL LAWS—WHY ENACT NEW DENTAL LAWS?

It behooves us, as dentists, to cast aside that "tired feeling" and to strive after better things. Even if we fail in the striving, our efforts may inspire others to take up the work and they may succeed ultimately in establishing not only better but more uniform dental laws.

Why should we enact new dental laws? This is a fair question. We answer, because the laws in force do not meet the demands of the times, as well as the evolution of our educational system. Legislation has not kept *pace* with the *needs* of this generation. We will produce some general reasons as evidence *why* we should establish *new* dental laws.

First—Little over one hundred years ago, there were not a hundred dentists on the American continent; today there are over forty thousand practicing dentists in the United States alone. Since 1841, in seventy years, 41,038 dental students have been graduated; in the last *ten* years 20,513 students, or *half* the number of dentists in the United States, have been graduated from dental colleges in this country, while we now have an estimated population of about ninety million people. Laws must be passed to meet these changed conditions. Where there are no dentists, no laws are needed. Where there are no civilized people, no dental laws are needed. They do not need dental laws in *Alaska*, but if you could put forty thousand dentists up there and ninety million people for them to practice upon, you would soon find out that dental laws must be passed. Increased population, accumulating wealth, growing intelligence, trained labor, higher education, luxurious living, changing political conditions, more exacting patrons, are some of the factors which compel the adoption of new laws suited to such changes.

Second—New dental laws should be enacted in accordance with the inexorable *fiat* of creation. Change is an eternal law of nature. There is no such thing as "standing still." *Growth* or *decay* is inevitable. We must climb upward, or sink downward; we must improve, or deteriorate; we must advance or retreat. The dental laws that suited the public twenty-five years ago, are obsolete today. Leaving out a few time-tried and fundamental principles, our laws need entire revision, in order to meet the changing conditions of the age, particularly our educational system.

Third—We should enact new dental laws, because every avenue of approach into the ethical practice of dentistry is policed by dental laws throughout the civilized world. Many civilized countries already possess dental laws which are more *stringent* for an American graduate than our own. As a result of our investigation we find that it is more difficult for an American graduate to obtain a license to practice dentistry in thirty foreign countries than it is in the United States.

SEVERE EXAMINATIONS

Besides fifteen European countries, seven South American governments and Panama, the dental examinations are represented, upon good authority, to be severe in Australia, British Columbia, Cuba, Japan, Java, Newfoundland, New Zealand, so that we may justly conclude that there are at least thirty foreign countries in which the legal restrictions upon the practice of dentistry are more formidable to an American dentist than in the United States of America. Here we have THIRTY arguments for enacting new dental laws better than the ones we now possess.

NO EXAMINATIONS NEGATIVE CONSIDERATIONS

Fourth—The countries without dental laws are deficient in population or stability, health or wealth, education or enterprise, intelligence or civilization. The *progressive* American does not aspire to be ranked with such nations.

ARGUMENTS

We find that one hundred and three established governments enforce dental laws, out of one hundred and thirty countries investigated.

BETTER DENTAL LAWS

Here are one hundred and three arguments why we should enact better dental laws if we want to take a place in the front ranks of nations known as *world powers.* But there are a multitude of other reasons. For instance, there is the question of *litigation.*

LITIGATION

Fifth—In Germany there is more litigation in the courts and more conflicting decisions rendered upon dental licenses apparently than in any other country in the world. We barely have time to digest one decision before another is thrust upon us. *Lawyers thrive* on the *contentions of men who have no law* to protect them or the public. In Italy the D. D. S. is barred, and there is frequent litigation before the tribunals of Milan, Venice and Naples, but the validity of the Act of April 24, 1890, by Roselli, Minister of Public Instruction, prescribing that only the M. D.'s may practice dentistry in Italy, has not been overthrown. (*Cosmos*, Oct., 1909, Dr. Camille Raido, Milan.) Lawyers collect numerous fees from dentists in several states, either because there is no dental law, or because the dental law is defective, or *obsolete*, or ambiguous. Therefore, we conclude that it is profitable to lawyers to have defective laws or no dental laws at all. Nail this point down fast in your memory and then clinch it. As a result of the frenzy for litigation possessing some men, in conjunction with other influences, *we predict* that in the *next ten years* every state will have to enact new dental laws, which has not passed a dental law within the last ten years. A dental law that has been in force in a state twenty years does not necessarily imply that the law is a perfect one. On the contrary it may indicate that dentists and legislators are enjoying a *nap.*

(To be continued)

PRESIDENT'S ADDRESS*

By Herbert Newman, Versailles, Kentucky.

I WISH to express my thanks to our worthy executive committee and secretary for the splendid program arranged for us. It calls for constant labor, and a high sense of duty, to arouse interest and secure contributions and compile a program, such as we have—full of practice, broad of purpose, searching for the best.

I always feel that our manufacturers deserve many words of praise. They are a vital factor in our daily practice, a great assistant, and deserve every encouragement. To all strangers, and non members, and exhibitors, we extend to you a most hearty welcome. Our entertainment committee consists of every member present and they will open up the flood gates of their hospitality and good cheer, and shake the glad hand of every visitor here.

Every man here must put his imprint on our program by taking the floor, speaking without hesitation, becoming an experienced association worker, I hope to hear much constructive criticism.

I hope the energies of this meeting and the coming year will be directed toward obtaining new members, research work, cooperation, oral hygiene education, and other things that will suggest themselves during our sessions.

There is one great plan that will accomplish all of this, and that is, component societies.

The work that has been done toward organization is good, but it must be taken up with renewed energies by our members and by our committee.

This committee must not let its ardor dampen, and always wait for an invitation to organize, but they must feel it their duty to take the initiative, and press it, when necessary, to get their societies organized. For the benefit of both state and component societies, I would suggest that our By Laws be so amended that the initiation fee of $3.00 be collected through local societies, the annual fee of $2.00 to be payable when in attendance.

As a means of strengthening the bond of friendship between the State and Component Societies, I would suggest that if our treasury will permit, the state society pay the expense of a clinician of one of our members once a year to any society with a membership of at least twenty.

As an adjunct to getting new members, the membership committee should urge a continual fight for new members throughout the year, instead of during the three days session.

I trust that each individual will do some research work. that the component societies will take up this work. There are many hidden truths in nature to be unfolded awaiting our efforts. Among them I will mention a better knowledge of how to alter the saliva is of paramount importance for the life of all operative work.

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*Read before the Kentucky State Dental Society, 1910.

The child's dietary for developing strong tooth substance is worthy of consideration.

Disease of the peridental membrane and contiguous parts needs study and development. A more liberal medical education is necessary for the best interest of our patients.

I plead for journal reading, there every tendency is for your elevation and edification, without which you starve yourself, you starve your clientele, you commit professional suicide.

Our new books are not read and studied as they should be, you can find many times their worth in every chapter.

We need more cooperation. We can maintain the confidence of the public only by cooperation.

We can secure legislation.

We can conduct a systematic education in oral hygiene.

Our legislative committee needs to probe deeper and give us clearer statutes on some points.

I would love for some feasible means of dental free clinics to be grafted into our system of charitable institutions. Its crying need is best known by our profession, and it is obligatory on us to press its claims. We note, with exceeding pleasure, the oral hygiene awakening taken up in your city. Is it not more important for the child to know how to take care of himself, strengthen his entire system by preserving his best digestive organs, than it is to know cube root, how to solve a most abstruse problem in calculus or speak in many tongues? The oral hygiene bill passed by the recent legislature, unanimously, was a signal victory for this cause, and to Dr. Rose's untiring efforts in its behalf all the praise should go, but the governor's veto came as a Waterloo in the hour of victory.

I trust our State Board will arrange interchange of license with as many states as is consistent with the interests of our profession. This is a matter to be seriously entertained, lest it put a premium on transient practice.

I recommend the establishment of a quarterly issued journal, whereby the acts of our component societies may receive publication.

But as I look over this body of men I feel that defeat is only a signal to fight, to fight along for the best, and though these are the best days of our association and the dental profession, there are better days yet to dawn, and as man profiteth as he enriches and beautifies the soil, so we will profit as we enrich and beautify our profession and our daily life.

THE confirmed nagger and the chronic kicker never know they are such. They consider themselves kindly advisors and beneficial critics, unappreciated and misunderstood.

REPORT OF THE DENTAL HYGIENE AND ORAL PROPHYLAXIS COMMITTEE*

AMONG the recommendations made by this committee at the Kalamazoo meeting, last June, two were urged upon the Executive Council: *First*, that samples of literature calling the attention of the public to matters of oral hygiene be sent to every member of the State Society, with the earnest recommendation that they be purchased in quantity and distributed by said members to those most needing them in their several communities, and *Second*, that a popular, illustrated lecture on the teeth and their relation to health be prepared, the same to be loaned to members of the society who would arrange to give the lecture in their respective localities.

Authorized to go ahead the committee sent five pamphlets, accompanied by the following letter, to every member of the society. This letter was mailed Dec. 10, 1909:

> Dear Doctor:—The enclosed pamphlets, one (The Mouth and The Teeth), published by the National Dental Association and procured of Dr. C. S. Butler, 267 Elmwood Ave., Buffalo, N. Y., at 50 cents per hundred, the other (The Care and Use of The Teeth), published by the trustees of the Bath Department, City of Boston, and distributed by the Dental Hygiene Council of Massachusetts No. 4 Joy St., Boston, Mass., at 25 cents per hundred, offer you the opportunity of doing a little educational work in your community at small cost. We are sending similar samples to every member of the State Society and suggest that each member purchase a few hundred copies and distribute them from time to time, with the view of acquainting the public with some of the fundamental principles of oral hygiene.
>
> As dentists, we hardly need reminding that there is urgent need for a systematic and energetic campaign of education along this line. Such facts as those recently revealed by an examination of the teeth of the school children of one of Detroit's public schools, showing that 97 per cent. of the children were in need of dental attention, that cavities averaged 4½ per child, that only about 10% claimed to own tooth brushes, and few, if any, knew the correct use of the brush, are familiar to us all.
>
> This state of affairs would be greatly improved if parents were aware of the conditions and their gravity. These little pamphlets may bring light to many and safeguard against much suffering, deformity and ill health, and, incidentally, greatly increase the demand for dental service in the community.
>
> This is but an initial step in an educational movement which the Committee on Dental Hygiene and Oral Prophylaxis hopes to inaugurate. Will you join us? If so, and you send for and distribute either of the pamphlets, let us know the results, or if you are now doing anything along this or similar lines, kindly let us know about it. We are feeling our way, your experience may help us and help others when we report your conclusions.
>
> Every member of the State Society is on this committee. Let us get busy, and when our report is made next June, let it proclaim that the committee as a whole is at work and doing something worth while. Fraternally yours,
>
> G. C. Bowles,
> Grace P. Rogers,
> William H. Giffen,
> } *Committee on Dental Hygiene and Oral Prophylaxis.*

No reply of any kind has been received from this effort. About 1,000 copies of "The Care and Use of the Teeth" have been distributed among the schools and social settlements of Detroit. This has been done by the local committee.

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*Read before the Michigan State Dental Society, 1910.

Those having the matter in charge offer us an unusually fine program; but, ladies and gentlemen, if this meeting could but awaken you to a full sense of your obligations; if it could so inspire you that on your return to your homes you would begin to teach what you now know, this alone would make our meeting a memorable, a boundless success.

Go back and preach and teach the gospel of oral hygiene. Teach the mothers the value of the deciduous teeth, the great importance of the sixth-year molar, and the prophylactic value of the tooth brush, properly used. Teach them the relation of a clean mouth and sound teeth to the physical, mental and moral development of the individual, and to the health and well-being of the community. You will hear much of this subject before this meeting is over, but do not let the matter end there.

We have a gospel to preach. The field is ripe for the harvest. Let us awaken to the importance of our message, and then go forth with a missionary zeal and proclaim it.

To aid in this work your committee has prepared a popular lecture entitled, "The Teeth and Their Relation to Health," illustrated with some twenty-five lantern slides. This talk and these slides are at your disposal if you will use them. In the use of this lecture, experience has shown that it is better to read, or deliver it first and to run the slides through afterwards. If the subject matter is familiar enough, however, an extemporaneous address, delivered during the exhibition of the slides is much more effective.

The lecture has been given four times in Detroit, three times in the public schools, once at the East Side Social Settlement. On the recommendation of Superintendent W. C. Martindale, a communication was sent to the Board of Education offering to give the lecture in each of the public schools equipped with a stereopticon, some sixty in number. Superintendent Martindale assures us that the offer will be accepted at the next board meeting. This, with a number of calls for next winter, from woman's clubs and social settlements, will keep one set of slides busy for the next two years. We ought to keep five or six sets busy throughout the state for the next two years. But if this report is read, accepted and buried in the usual order, we will do nothing of the kind, therefore, it is not going to follow the usual order. If you accept this report your president must appoint a public lecture committee in each of the ten districts of this society and between now and the next annual meeting at least ten public, illustrated lectures on oral hygiene will have been delivered, in as many different parts of the state. It is suggested that the presidents of the district societies be the chairman of the lecture committees and that the work be done through society channels, thus avoiding any pretext for that petty jealousy which too often mars effort of this kind. The Lecture Committee is to select a speaker, make all arrangements and give at least one public lecture in its district within a year. While it is at it, it might give a dozen. After the start is made the rest is easy. Each committee must make a written report at the next annual meeting, and the secretary of this society is instructed to see that all of these reports are so presented. As far as possible the committees should be appointed at this meeting, now, if practicable, and dates arranged so that each district may have the slides, say for a month, before passing them on to the next district. The committee on Dental Hygiene and Oral Prophylaxis must render all possible aid to the local committees in the furtherance of this work.

Some expense for express charges will be incurred. The State Society should stand this. At present we have but one set of slides and as they were paid for by the First District Society, they rightfully belong here. A number of the slides are the original work of Dr. R. W. Bunting, Ann Arbor. They are his free gift to the cause. This society should order two or more sets of slides, depending upon the interest shown in the work.

If this work is carried out as we propose to do it in Detroit, public conscience will be awakened and needed legislation will easily be secured looking to the care of the teeth of the state's charges in its prisons and in its reform and its charitable institutions. The required examination of the teeth of public school children will also become a fact.

With the increased knowledge of oral hygiene will come a fuller appreciation of dental service, and a larger demand for it. Indeed, Dr. Hoff fears that this educational campaign now being waged throughout the country will result in the death of the present generation of dentists from overwork. Well, let us die—the cause is a good one.

It is our intent to confine this report to this one subject and to let nothing detract from or obscure its purpose. In closing, however, a word as to the local free dental clinic may be helpful. As you know, this free dental clinic for the children of poor parents is conducted and supported by the First District Dental Society, in quarters furnished free of charge, at Grace Hospital. Its second year, closing next Saturday, June 18th, has been a successful one and has demonstrated the need of, not one, but half a dozen free clinics, operating six full days a week. Such clinics could easily be kept busy caring for the children, who, as it is, are doomed to suffer from the neglect of their teeth.

Two hundred and seventy-two of these unfortunates little ones visited the clinic during the past year, making, all told, 533 visits. On an average one tooth was filled and one tooth was extracted for each child, 80 prophylactic treatments were given, 61 roots were treated and filled, and temporary treatment was given to 81 cases.

Next fall the committee is planning to start a new clinic in quarters furnished and equipped by the Board of Health in the Board of Health building. The present clinic, it is expected, will be taken over and maintained by the authorities of Grace Hospital. This will give Detroit two free clinics, an encouraging start.

Some reference to the progress being made toward popularizing the fundamentals of dental hygiene in so many parts of the country, ought, perhaps, to appear in this report. The subject is important and highly interesting, but too long for consideration at this time; moreover, it would tend to obscure the recommendations which we wish you now to consider.

Respectfully submitted,
G. C. Bowles,
Grace P. Rogers.
William H. Giffen,
Committee on Dental Hygiene and Oral Prophylaxis.

Dr. G. C. Bowles (concluding): We are all agreed that the public needs educating in matters of oral hygiene. Your committee is convinced that the illustrated popular lecture is an effective aid in accomplishing this. Owing to a crowded program, the lecture prepared and use by your committee for this purpose will not be delivered at this meeting as was originally intended, but printed copies of it, showing, very imperfectly, about half the slides used, are here for free distribution. Should additional copies be desired for use among patients they may be bought of the committee at cost, about five cents apiece.

If Michigan takes up this educational campaign in the manner outlined, and we hope it will, it will be among the leaders in this beneficent, world-wide movement.

I would suggest that the president of each district in the state, if possible, or some one else who will be active, be appointed as chairman of a Public Lecture Committee, by our president, to further this work in his section.

ABSTRACT OF DISCUSSION.

Dr. M. L. Ward, Ann Arbor: I can only express my approval of the suggestions of this committee. I shall be very glad to do anything I can to aid this work if started. As I understand the idea of Dr. Bowles, he would like to have the chairman of all these districts act as a committee, either with him or some one else to look after this lecture and see that it is started. After it is started, if these slides are in each district, they will be made use of. I for one shall be glad to do all I can. These slides, as they are prepared, would not require a very great effort on the part of any one, and we could find a man or two in the district who would start the thing, and that is what we are after now.

Dr. P. F. Hines, Lake Odessa: I would like to ask a question -is the idea of this lecturer to have some local man in the district give this lecture?

Dr. Bowles: Yes.

President: The idea is that the President of each District Society shall be appointed chairman of a committee and see that this lecture is taken up and given.

Dr. Bowles: Maybe a half dozen men may give it, or one man.

Dr. S. J. Lewis, Kalamazoo, Mich: The suggestion of Dr. Bowles appeals to me very strongly, and in connection with the idea of taking up this matter with the societies I will say that in our district Kalamazoo, we have a local society that is in no way connected with the State Society or any other society. We merely organized for good fellowship and at our meetings we took up the matter of lecturing before the schools and various societies, and although we have not acted upon it, we suggested that a committee be appointed and this committee prepare a lecture, which of course would not be necessary if the lectures are already printed.

I want to give you for a practical illustration the result of lectures such as these. A club, of which I am a member, had a series of lectures given by some of the lady physicians of Kalamazoo, and one of the lectures was upon the care of the mouth. It did not leave a very deep impression, so they came to me and asked me if I would give some sort of a lecture on this subject, thinking that it might come from a dentist better than from a physician. I thought that if I could give them the briefest outline of this subject, I would give them something tangible and we know they will always grasp something tangible, thereby leaving a deeper impression upon their minds. I wrote to Dr. Runyan, of South Haven, who I knew owned a set of slides, and asked him if he would let me have them for this purpose. I took these slides and had one of the school lanterns sent up to the club and in this way I gave them a lecture which I had not really prepared. I explained the slides, using a practical illustration with each one, and when I finished the lecture most everyone in the room came up to me and said that they had really learned something about the care of the mouth and teeth.

I think that this is one of the finest and the only way to get this matter before the public, and I would like to see it established soon. I will pledge myself to do all I can in our district to see that it comes before all the members of the society.

Dr. W. R. Alvord, Detroit: I heard this lecture given before the First District Dental Society, and I think it is too bad that you can't all hear it; hear it rather than read it. Of course, your reading it will help you in the study of it, but if you hear it, and feel the impression it makes on you, you carry away a great deal more enthusiasm than you would by sitting down and reading it. Now, this will simplify our talks at the chair, which, of course, every progressive dentist has to do more or less. A great many dentists show that side of it, rather than take up too much time by argument with their patients. The necessity of an education along this line is undoubted, and this is a very conclusive and clear paper on that subject. I think there will be something done to present this paper throughout all places.

Dr. J. W. Lyons, Jackson: I realize that this committee has taken up this subject very thoroughly. They have been in this sort of work not only this year but years previously. They have made a thorough study of it, and have worked it out practically here in Detroit. Their suggestions are worthy of our highest consideration, and I think it is the proper course for the State Society to permit this work. I will make a motion that the suggestions be carried out, and that the president appoint these committees as suggested by the essayist.

President: You have heard the motion by Dr. Lyons, and supported by Dr. Honey, that these suggestions made by Dr. Bowles be carried out and that the presidents of each district be appointed chairmen of their divisions. Carried unanimously.

THINK for yourself! But to think for yourself you ought to know what others are thinking and have thought. We work by elimination—and every wise man is familiar with all foolish schemes of philosophy. This is necessary, because all truth is comparative, not final. Every good business man knows the get-rich-quick schemes, recognizing them on sight, and leaving them severely alone, just as every good bank cashier or teller knows all financial flim-flams a mile away. Know what others are thinking, and then go beyond them and think for yourself. Thought is hygienic, sanitary and makes for sanity and length of days.

EDITORIAL

PREACHING THE GOSPEL OF ORAL HYGIENE

NEVER has the wave of enthusiasm of teaching oral hygiene spread so far and wide as today. Throughout not only the United States and Canada, but the whole civilized world the gospel of oral hygiene is being preached more or less to the people. It has had such an impetus that nothing can stop it, and nothing should, for it means more to the people and coming generations than even dentists themselves have realized.

But what about the dentists? With the dissemination of knowledge to the public regarding oral and dental hygiene and the necessity for better care of the teeth, will the dentists be able to care for all patients that will present?

At first thought the dentist may smile at this statement, but it is a matter for serious consideration. In communities where an active campaign has been established and dentists are working in conjunction with boards of education, or boards of health and physicians, it is reported that a marked increase in the number of dental office patrons has taken place. The dentist who formerly had some leisure hours is now busy his full time and the already busy dentists are wondering what they will have to do to take care of the increased patronage.

Statistics show that only about eight per cent of the people are regular patrons of the dentist and most dentists are busy now. What are they going to do when six, eight or ten times the present number of patients want dental services?

We have mentioned this side of the subject, not that we for a moment think it the main object in educating the public in dental matters, but to call attention to the ultimate result of such teaching aside from the incalculable benefits to humanity.

In the first place it is our duty from a humanitarian point of view to give the public all the information we can that will benefit the health of the people, prolong life and make better citizens. And we should give this with no thought of how it may sooner or later redound to our credit or interests.

More papers on the subject of oral and dental hygiene have been read before dental societies in the past year than ever before in any one year and THE SUMMARY will publish many of these for the reader's benefit. Among them he will find articles written expressly for instruction of the public and which may be used as lectures before schools, societies or meetings of the people.

The movement for better oral conditions is a most worthy one and should be furthered in every section of the land.

SOCIETY·ANNOUNCEMENTS

American Miller Memorial

To the Dental Profession of America:

The Committee appointed at the December, 1909, meeting of the Ohio State Dental Society for the purpose of raising funds for an American Memorial to perpetuate the memory of the late Dr. Willoughby D. Miller, desires to make the following report:

Honorary Committees have been appointed in the several states to solicit contributions by which their state may be represented in the fund. It is due to their hearty co-operation that the following report points to a successful issue of this undertaking to express the appreciation of American dentists for the work of Dr. Miller. The amounts asked for from the several states are prorated according to the membership of the state societies; in some instances these amounts have been partial, while in others they have been slightly over subscribed. The Committee deems it inadvisable to take steps toward the construction of this memorial until the fund, which will approximate $8,000, is fully subscribed and in the hope this condition will be brought about by Fall.

The following subscriptions are now in the hands of the treasurer, Dr. Weston A. Price, of Cleveland, Ohio. Individual subscriptions, while included in the following, will appear in the name of the donor in our final report in the journals: Alabama State Dental Society, $25; Arkansas State Dental Society, $50; California State Dental Society, $10; Almeda County California Dental Society, $10; San Francisco Dental Society, $20; Sacramento County Dental Society, $10; Colorado, Odontological of Colorado Springs, $25; Connecticut State Dental Association, $50; Georgia personal subscriptions and State Dental Society, $35; Illinois State Society, $150; Illinois Component Societies, $216; Illinois personal subscriptions, $165; Indiana State Dental Society, $50; Eastern Indiana Dental Society, $25; Iowa State Dental Society, $200; Kansas personal and State Society, $134.50; Kentucky State, local and personals, $105; Montana State Dental Society, $15; Nebraska personal and State Society, $100; New Hampshire State Dental Society, $25; New York Odontological, $25; New York Institute of Stomatology, $50; South Carolina State Dental Society, $25; North Dakota State Dental Society, $50; South Dakota State Dental Society, $15; Oregon State Dental Society, $50; Pennsylvania State Dental Society, $200; Lebanon Valley Dental Society, Pa., $10; Tennessee State Dental Society, $50; Texas State Dental Society, $50; Utah, Salt Lake City Aux. Delta Sigma Delta, $14; Ohio State Dental Society, $1,000; Cincinnati Odontographic, $100; Columbus Dental Society, $100; Northern Ohio Dental Society, $200; Virginia State Dental Society, $50; West Virginia State Dental Society, $25; Washington State Dental Society, $50; Wyoming State Dental Society, $10. Total, $3,494.50.

Expenses of our Committee, including printing, stationery, postage and stenographic work to date amounting to $79.90, have been taken care of by the Ohio State Dental Society.

In addition to the above the State Societies of Massachusetts and Missouri have each subscribed $100, and Mississippi, $50, while several other states have subscribed amounts not definitely reported at this date. Personal subscriptions from Columbus dentists will approximate $500.

Other professions have established memorials to their distinguished dead; dentistry has done it before and we appeal to your spirit of loyalty and patriotism to aid in honoring this American whose life was one of untiring devotion to the scientific advancement of our profession. Yours very truly,

EDWARD C. MILLS, *Chairman*,
16 South Third St., Columbus, O.
J. R. CALLAHAN,
25 Garfield Place, Cincinnati, O.
S. D. RUGGLES,
Portsmouth, O.

WISCONSIN BOARD OF EXAMINERS

The semi-annual meeting of the Wisconsin State Board of Dental Examiners will be held in Milwaukee at the Dental Department of the Marquette University, corner 9th and Wells streets, beginning Monday, June 12, 1911, at 9 a. m., for the examination of applicants for license to practice dentistry in Wisconsin. All applications, together with the fee of $25.00, must be in the hands of the secretary fifteen days before the examination. For application blanks and general information, address G. C. Marlow, Secy., Lancaster, Wisconsin.

THE KENTUCKY STATE ASSOCIATION

The forty-second annual meeting of the Kentucky State Dental Association will be held at Owensboro, May 25th, 26th, 27th, 1911. This is to be the last State Dental Society to hold its annual meeting, according to the circuit established between Iowa, Illinois, Indiana and Kentucky; hence we expect to have an unusually large exhibit as well as a good program. All members of the profession are cordially invited. Full announcement later. W. M. Randall, Secretary, corner Brook and Broadway, Louisville, Kentucky.

SOUTHWESTERN MICHIGAN DENTAL SOCIETY

At a meeting of the Executive Board of the Southwestern Michigan Dental Society, held at Kalamazoo, Feb. 5, it was decided to postpone our regular spring meeting until fall and meet with the State Society at Grand Rapids, April 10, 11 and 12. A special time, morning of April 11, is set on program for a business meeting of this Society. Members of our Society will not be required to pay dues at this meeting. R. A. Bowie, President. R. E. Patterson, Secy. and Treas.

THE MISSOURI STATE ASSOCIATION

The forty-sixth annual meeting of the Missouri State Dental Association will be held in Joplin, June 13, 14, 15. An elaborate program is being prepared and indications are that this will be the best meeting ever held by the Association.

For advertising space, program or other information address Dr. J. A. Cotton, Chairman of the Executive Committee, Joplin, or Dr. S. C. A. Rubey, Secretary of the Missouri State Dental Association, Clinton.

NATIONAL DENTAL ASSOCIATION

The Clinic Program for the meeting at Cleveland promises to be an unusually interesting and profitable one. Every effort is being put forth to secure the very best talent as clinicians in the profession. It is our intention to make this clinic the most interesting and profitable one in the history of the National Association. We have at this date (March 1) secured men of national reputation to clinic on the following subjects: Oral Surgery, Prophylaxis, Orthodontia. We hope to arrange a Concerted Gold Filling Clinic (by ten operators) under direction of Dr. Southwell, of Milwaukee; Progressive Gold and Porcelain Clinics, Gold Inlays, and many other demonstrations.

Send in your names at once with title of clinic to any member of the Committee, that we can have the program published in the June issue of the journals. D. O. M. Le Cron, Chairman, 501 Missouri Trust Bldg.

MINNESOTA STATE DENTAL ASSOCIATION

The twenty-eighth annual meeting of the Minnesota State Dental Association will convene in Masonic Temple, Minneapolis, June 9, 10, 1911. A number of clinicians in addition to home talent will be present, and a manufacturers' exhibit is also being arranged. The profession is cordially invited. Address inquiries or suggestions to Benjamin Sandy, Secy., 827 Andrus Bldg., Minneapolis, Minn.

MICHIGAN STATE BOARD DENTAL EXAMINERS

The next regular meeting of the Michigan State Board of Dental Examiners will be held at the dental college building at Ann Arbor during the whole of the week of June 19, beginning on Monday at 8:00 a. m. All applications and fees should be in the hands of the secretary at least ten days before that date. For full information address A. W. Haidle, Secretary, Negaunee, Mich.

THE NORTH CAROLINA DENTAL SOCIETY

The North Carolina Dental Society will hold its thirty-seventh annual meeting at Morehead City, June 28th, July 1st, 1911. All ethical dentists are cordially invited to attend. Arthur Hynes Fleming, President, Louisburg, N. C. J. W. Stanley, Secretary, Wilmington, N. C.

NORTH DAKOTA DENTAL ASSOCIATION

The sixth annual meeting of the North Dakota Dental Association will be held at Fargo, North Dakota, on May 16th and 17th, 1911. F. A. Bricker, Secretary, Fargo, N. D.

SOUTH CAROLINA ASSOCIATION

The forty-first annual meeting of the South Carolina State Dental Association will be held in Columbia, S. C., June 20, 21 and 22, 1911. W. Busey Simmons, Secy.

NEWS and OPINIONS

RESULTS

Under this head we shall print from time to time reports of the establishment of dental inspection in public schools, free dental clinics and other news from the field of dental education as the work goes on. We shall thank our readers if they will keep us fully advised of all developments in their locality.

The attention of every reader is earnestly invited to the following letter from Mrs. Van Gastle, the dental nurse employed by Dr. Ebersole to co-operate with the Oral Hygiene Committee of the National Dental Association in the work undertaken in connection with the test class of the Marion school at Cleveland, report of which appeared in a recent number.

Mrs. Van Gastle entered into the work in a whole-hearted, earnest manner and much of the gratifying success attending the work is due to her untiring efforts.

Cleveland, O., March, 1911.

It is with pleasure I respond to the request made by The Dental Summary to give a synopsis of the work I have been privileged to perform for Dr. W. G. Ebersole, of this city.

In June, 1910, a class of children, ranging from eleven to sixteen years of age, was selected from Marion School, Cleveland, these children being deficient mentally and physically.

The purpose of the class was to determine what results could be obtained by *placing their teeth in perfect condition* or correcting diseased conditions of the teeth and mouth. It did not require the eye of a professional to see their great need. Their teeth were badly decayed and gums diseased. They were suffering from malnutrition, indigestion, constipation, heart trouble and degeneracy. The class has been provided with tooth brushes and powder, something that many of them had not possessed before. A three-course dinner was given at the school by Dr. Ebersole to teach them thorough mastication, our theory being that if the teeth are kept perfectly clean and are used as intended by nature, chewing the food in a dry state, which forces the blood into the teeth, that a great deal of dental trouble would be overcome.

The homes from which these children come, with the exception of three or four, are those of poverty, the parents having no knowledge of themselves or of sanitation. The families are large, ranging from eight to thirteen, and live in rooms or very small houses with little or no ventilation.

It has been my work, as Dental Nurse, to see that all of Dr. Ebersole's instructions were carried out. In order to do this it has been necessary to visit these children in their homes weekly, examining their teeth and instructing the parents in regard to ventilation and sanitation generally. Also to impress upon them the importance of their co-operation with us in insisting upon the children chewing their food well, which I have found has resulted not only in their losing a desire for the sloppy foods which they had been having, but where some of them were taking four and five cups of coffee daily they now take none.

Since last June dentists have been employed working upon the children daily, and as there has been such a large amount of work to be done, it is not yet completed. Yet, in spite of the irritation incident to the work, and the time lost in being called from their lessons, there has been a steady improvement in their school work, and where truancy cards have been carried they are now abandoned.

Two psychological tests were given at the opening of the class and record taken of their mental condition before any dental work had been done. Four other tests have been given since with an average improvement of 37½%. The physical improvement has kept pace with the mental. One child, who had been subject to severe heart attacks weekly, since being in the class has had but one hard attack and two light ones. Those suffering with constipation are having no further trouble. Another child suffering from kidney trouble, demanding care at night as well as special care at school, is entirely cured. We are compelled to give the dental work credit here, for *this child has received no medical treatment* for this trouble. When this girl was received into the class she was pale and poorly nourished. She is now a healthy child with good color and growing rapidly. It might be of interest to mention here the statement made by the teacher of this child, that when she came into her room "to teach her was like pounding into wood, but now she is just like a new girl, grasping the work readily." The entire class is revitalized, better nourished and complexions clearer.

The effect on degeneracy is most marked. One of our boys, whom the principal of the school declared her worst pupil, is now a quiet little gentleman and the principal is delighted with him.

In closing, would add, from my point of view, this work is far-reaching. Coming in personal contact as I do with the home life of these people it is very interesting to see the effect upon the parents and other members of the family. At first, through their ignorance they were not able to realize the value of the work we were doing for their children, but when they began to see results and we had won their confidence we then had their co-operation, and I find them eager to learn. Time alone will tell what this work has done. If in seven months the above results have been obtained and not a case of illness during all this time until the week of January 16th, one child was out of school four days with grippe; we naturally can expect after the dental work is completed a still greater improvement in every way. A number of requests have been made for other children who were just as needy as these and are disappointed because they cannot have attention.

I trust that the results with this class will inspire the interest and co-operation of those empowered to further this work that others may reap the same benefit.

(Mrs.) Maude M. Van Gastle,
Operating under the Oral Hygiene Committee of The National Dental Association.

After the above report was in type we received a second letter from Mrs. Van Gastle, calling attention particularly to the case of one boy, aged twelve, small for his age, thin and pallid, who has increased four pounds in weight. This, with his improved color and greatly increased activity and energy, makes him seem like another boy.

Another marked improvement is apparent in the great comparative reduction in pupils who failed to make their grades or "pass" as it is called. Other buildings in the same class as to location, surroundings and character of pupils show much greater percentages of failures: Brownell, 16.12%; Case-Woodland, 14.31%; Eagle, 12.37%; Longwood, 22.69%; Mayflower, 21.23%; Outhwaite, 18.76%; Sowinski, 16.50%; Sterling, 26.06%; Willson, 16.68%, and Marion, from which the dental test class was drawn, only 9.92%. The belief that these splendid results are due almost wholly to the dental care bestowed upon these pupils is warranted by the fact that the Marion school, in common with all other city schools, had been given medical attention for three years prior to the beginning of the dental work, without noticeable difference in results.

Dr. Dowd's Itinerary.

On Monday evening, March 13, our lecturer visited South Bend, speaking that evening and three times on Tuesday before the children of the high school, grade schools and parochial schools and the general public.

The lectures were delivered under the joint auspices of the local Dental Society and the school authorities. The audiences were large and manifested enthusiastic appreciation.

A feature in connection with the South Bend engagement worthy of note is the fact that the Medical Society adjourned its meeting and attended one of the lectures in a body.

On Wednesday, March 15, Dr. Dowd visited Hastings and on Thursday, Dowagiac, Mich., speaking five times at the two places, before large audiences of adults and children.

Everywhere great interest on the part of the public is shown and good results follow.

The profession at South Bend is largely indebted to Drs. J. H. Stoeckley and R. F. Lucas for preliminary work done. At Dowagiac arrangements were in the hands of Dr. F. H. Essig, and at Hastings in those of Dr. Frank Carrothers.

On April 5, Dr. Dowd is to visit Atlanta, working under the direction of the Southern Branch of the National Association.

On June 28, 29 and 30, and July 1, Dr. Dowd will be the guest of the Colorado State Society during its convention at Boulder, delivering a number of lectures before the members of the profession, school children and the public generally.

Knowing from experience the great good resulting from these lectures, not alone to the public but to the profession as well, we cannot understand why there is not more general interest being shown by dentists in this work, unquestionably the greatest, farthest reaching and most beneficent ever undertaken within or for the profession. Those interested are invited to correspond with The Summary.

Montreal, March 11th, 1911.

The Dental Summary, Toledo, Ohio.

Nothing has yet been done to educate the public in this province. We want to employ a lecturer to speak before societies, school teachers, etc.; later on we want to go before the public. What would it cost to send Dr. Dowd here?

Kindly tell us what kind of lantern he uses.

We congratulate you on the articles which have appeared in many newspapers. We had those printed in the Hearst papers translated into French and printed in "La Presse," which has 100,000 circulation. We reproduced the cuts and it was well handled. We believe very much in the educational campaign.

We have founded St. Luke's Hospital which was incorporated by special act of the Quebec Parliament, the object of which is to treat poor school children, give conferences, lectures on hygiene, etc., with right to open a post-graduate course and issue diplomas.

We are just beginning; there is an immense field in which nothing has been done. There are only 200 dentists in a population of over 200,000. Beginnings are very hard. Our dentists are absolutely non-progressive and our dental board is perhaps the slowest in America.

We are sending you under separate cover copy of our St. Luke's Hospital report and shall be glad at all times to do what we can to help the work along.

THE FRANCO-AMERICAN DENTAL INSTITUTE, LTD., DR. G. MALLET

Superintendent Condon, of the Providence, R. I., schools, in his last monthly report submitted, urged the care of the teeth of the pupils who attend the public schools. He spoke of the work done by Dr. James C. Colton, the school department dentist, who has made a dental chart for each of the 595 pupils in seven schools that he has already examined. Superintendent Condon suggested co-operation between the health department and Dr. Colton. He also said that a plan is in development to have dental work done at reduced rates when the parents of children are unable to pay the usual prices.

Springfield, Ohio, March 14.—The Clark County Dental Society met last evening with Dr. W. C. Lupfer and a program consisting of topics pertaining to the welfare of the profession was carried out.

A number of talks were given on the educational work which is holding the attention of a number of cities in regard to the proper care of the teeth, and educating the people to have their teeth examined more often.

A late number of *The Christian Endeavor World* devotes nearly a page to extracts from an address by Paul Gardner White, D. M. D., before the Boston School Board and the Boston Schoolmasters' Association on the supreme importance of the care of the teeth.

A bill has been introduced in the Ohio legislature giving the state university power to absorb the Starling-Ohio, medical and the Ohio Dental colleges. The bill also provides for the establishment of a department of medicine and dentistry at the state university.

Fifteen children appeared at the Wilmington, Del., free clinic on February 16, where Dr. D. S. Winner held the first of a series of free dental clinics for the poor of the city. Every Thursday from noon to 1 o'clock these clinics will be held.

Dr. W. E. Stewart, Morgantown, W. Va., is preparing to enter the lecture field. He will be glad to outline his plan to any who are interested. Talk it over with him at conventions.

The Cleveland Dental Society at its session at Winston-Salem, N. C., February 17, adopted resolutions endorsing the movement for dental inspection in the public schools.

By the action of the City Council in voting $1,000 to furnish and equip a room in the City Hall, a free dental clinic becomes an accomplished fact at Elmira, N. Y.

Dr. Chas. S. Schlegel, of Reading, Pa., is delivering educational lectures in his vicinity. Churches and other public buildings are open for such lectures.

Our good friend Dr. George Hunt, of Indianapolis is now delivering stereopticon lectures as a part of his contribution to the educational campaign in Indiana.

Urged by the *Journal*, the authorities of Meriden, Conn., have taken up the matter of free dental clinic and favorable action is expected at an early date.

Dr. Chas. M. Dunne, of Norwich, N. Y., is delivering stereopticon lectures on oral hygiene in his vicinity.

Indianapolis dentists have inaugurated a state-wide educational campaign.

Pottstown, Pa., now has free examination in the schools and free treatment of those whose parents cannot pay.

Dentists of Little Rock have offered their services free of charge for examination and treatment of needy children.

The Milwaukee free clinic is operating regularly and the dentists who contribute their services have plenty to do.

The equipment for the free dental dispensary at Watertown, N. Y., has been installed and the clinic opened.

The first free dental examination in the Wilkes-Barre public schools took place March 7.

The Knox Co., Ills. Dental Society is moving for free clinics within its jurisdiction.

WHAT IS DOING IN THE SOCIETIES

The Toledo Dental Society held its annual clinic Friday, March 10. The morning session was held at the free dental clinic, District Nurses' building, Monroe and Sixteenth streets, and the afternoon session in the rooms of the Buckeye Dental Supply company. Luncheon was enjoyed at noon at the Boody house.

The morning session was devoted to a cleft-palate operation most skilfully and successfully performed by Dr. C. J. Lyons, Jackson, Mich., and to an address on pyorrhea technique by Dr. L. L. Barber. In the afternoon various subjects were discussed by Dr. F. L. Olds, Dr. E. A. Cole, Dr. J. B. Pettibone, Dr. J. E. Sheffield, Dr. L. T. Canfield, Dr. G. A. Mochel, Fremont; Dr. J. W. Hartshorn, Dr. S. S. Whetstone, Dr. E. L. Phelps, Dr. J. D. Sullivan, A. C. Hills, Elory Rees, R. W. Sweetman and Gustav Scharmann, of New York.

Quite an entertaining innovation was introduced by "Dr. Weis Nicht," who exhibited his "patented" device for securing bite and model simultaneously, by means of his "bite-center and piston appliance," operated by a derrick, and a most ingenious mechanism for arousing the "gagger" to unusual activity.

The attendance was large and the clinics interesting.

Port Huron, Mich., March 10.—The bill about to be introduced in the state legislature, requiring all dentists to pay a tax of $1 a year for the privilege of practicing their profession, has received the endorsement of the St. Clair Dental Society. It is, however, meeting with opposition in certain quarters.

It is said that the object of the measure is to supply the dental board with funds to prosecute illegal practitioners. The claim is made that if the laws are violated, the prosecution of violators should be made a public and not a private charge against the dentists, and that the attempt to make the dentists, by a poll tax, bear the expenses of the dental board is class legislation and void.

McCook, Neb., Feb. 24.—The Southwest Nebraska Dental association held its semi-annual session here yesterday. The meet was marked by a program of unusual excellence and strength in papers, clinics, etc. The new officers are: Dr. J. F. Nelson, of Superior, president; Dr. G. M. Boehler, of Alma, vice president; Dr. W. H. McHenry, of Nelson, secretary-treasurer. The new session will be held in Red Cloud in September. The session closed last night with a banquet and toasts, the banquet being served by the Pythian sisterhood in Masonic banquet chamber.

Pana, Ill., Feb. 22.—At the seventh annual meeting of the Central Illinois Dental society officers were elected for the ensuing year as follows: President, Dr. B. F. Dowell, Pana; vice president, G. H. Lowe, Windsor; secretary, S. P. Bowyer, Taylorville; treasurer, Harry Hoover, Shelbyville; librarian, H. C. Lacharite, Assumption.

The next semi-annual meeting of the society will be held at Shelbyville next September. The reports of the officers showed the society to be in a fine condition.

Denver, Colo., Feb. 24.—Plans are almost completed for the incorporation of the Colorado Dental Protective association, with headquarters in Denver. The purpose of the organization will be to elevate the practice of dentistry and promote and encourage co-operation among members of the profession. There will be social meetings for the purpose of considering various matters which pertain to dentists and dentistry, and all members of the organization will be protected by the association.

The largest gathering of dentists ever held in the New England states is expected at Fabyans, N. H., June 27, 28 and 29, the occasion being a union convention of the societies of three states, Maine, New Hampshire and Vermont.

Iowa City, March 8.—Five of America's foremost doctors of dental surgery, deans of American colleges of dentistry, will be here today to conduct the university convocation exercises. They will deliver as many addresses. The distinguished guests will be Dr. Eugene H. Smith, Harvard; James G. Sharp, California; N. S. Hoff, Michigan; Edward C. Kirk, Pennsylvania, and Alfred Owre, Minnesota.

The Oklahoma State Association.

The annual convention of the Oklahoma State Dental Association will be held at Enid, June 1, 2, and 3, 1911. This is expected to be the largest and best meeting in the history of the association, and all ethical dentists are urged to attend and take part. C. R. Lawrence, D. D. S., Enid, Oklahoma.

The Miami Dental Society, of Dayton, Ohio, at its meeting March 7, took steps to insure the prompt collection of delinquent accounts. A collector is to be employed to run down and hold up debtors in arrears and enforce settlement where possible.

The G. V. Black Dental Club held its annual clinic at St. Paul, Minn., February 16 and 17, with nearly a thousand dentists in attendance. Dr. Black was in attendance and addressed the meeting on the evening of the second day.

The Eighth District Dental Society held its meeting at the Prospect House, Niagara Falls, February 14.

Nearly 500 dentists are expected in Syracuse for the forty-third annual spring meeting of the Fifth District Dental Society, April 13, 14 and 15. Officers believe the meeting this year will be the largest in the history of the organization.

DEATHS.

Shelbyville, Ky., March 10.—Dr. M. L. S. Buckner died this morning at 4 o'clock at his home on Main street, of cancer of the stomach. He was born in Spencer county seventy-one years ago last month, but had continued in vigorous strength and the active practice of dentistry until last fall, when his health began to fail.

November 3 he was taken to the Norton Infirmary where an operation by Dr. Louis Frank revealed conditions which precluded the hope of his recovery. After two weeks he was brought home. The fatal nature of the disease was not revealed to him and he continued confident of his ultimate recovery, cheerfully greeting the many friends who called to see him. During the past two weeks his strength failed rapidly and for several days preceding his death he was unconscious and unable to take nourishment in any form.

Cleveland, O., Feb. 17.—Dr. J. T. Barclay, 75, pioneer dentist of Cleveland, died yesterday at his home, 5718 Cedar avenue, southeast. Until three years ago, when he retired, he had practiced in Cleveland twenty-eight years.

Dr. Barclay was born at Columbiana, November 8, 1835, and first studied dentistry in Beaver, Pa. At that time, nearly half a century ago, there were no dental schools and Dr. Barclay was obliged to learn the profession entirely by himself.

News was received at Northampton, Mass., March 9 of the death of Dr. P. P. Nichols of that city, which took place at Bermuda, whither he had gone in December in search of health. Dr. Nichols was 50 years of age and had practiced in Northampton for many years. Cause of death Bright's disease.

Springfield, Mass., Feb. 18.—Dr. Ammon Farnsworth Davenport, 84, the oldest practicing dentist in North Adams and the first college educated dentist to locate in North Adams, died yesterday afternoon at his home on Church street, after an illness of several weeks.

New York, March 16.—Dr. John Lawrence Allen, dentist, of No. 128 East Twenty-ninth street, was found in his apartments yesterday, half-dressed, on a couch, dead from heart disease. Dr. Allen was 40, unmarried, wealthy and lived alone. The body was found by his assistant.

Dr. Frank E. Post, of 19 Catherine St., New York, was robbed and murdered March 7 by a Chinatown tough, said by the police to be John Dalton, alias John Brady.

The Knox Co., Ill., Dental Society at its meeting February 25, passed resolutions of respect and condolence in connection with the death of Dr. Edgar C. Stone.

Dr. Henry S. Abendschein, 52, 424 No. Calhoun St., Baltimore, March 2, of paralysis.

Dr. George E. Shallenbarger, 57, of Hamburg, Pa., of diabetes.

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THE DENTIST'S PATIENT

A leaflet designed to convey useful information respecting the care of the teeth. Supplies of this interesting treatise on oral hygiene are furnished free of expense to dental practitioners for distribution among their patients. A specimen copy, together with an order-form, will be sent upon request.

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ROBBERIES

Tacoma, Thursday, Feb. 23.—The local police are engaged in a strenuous effort to run down a band of thieves that in the past few weeks has stolen a large quantity of gold teeth, gold crowns, gold leaf and other dental gold from Tacoma dentists.

The office safe of Drs. T. R. and M. J. McNerthy, Fidelity Building, was looted of gold crowns valued at more than $35. The Empire Dental Company, Pacific Avenue, suffered to the extent of $30 worth of gold leaf. Close to $20 worth of gold scrap was taken from the office of Dr. J. R. Parsons, Fidelity Building. Dr. R. A. Funk, with offices in the same building, reports the loss of $15 in gold crowns. Gold teeth and crowns and gold leaf of a combined value of $35 were stolen from the offices of the Chicago Dental Parlors, with offices in the Langlow Block.

To vary their operations, the same thieves, it is believed, broke into the offices of a surgeon, Dr. C. Stuart Folson, Pacific avenue, and walked off with a number of valuable surgical instruments.

Boston, Mass., March 2.—Harry E. Hunt, arrested last night on the charge of burglary, was arraigned in the Municipal Criminal Court this morning before Judge Wentworth,and was held in $3,200 for the grand jury. Three counts of breaking and entering were charged against him. His brother, Fred Hunt, who also was arrested last night, was of an age which brought him in the jurisdiction of the juvenile session before Judge Baker. Mrs. Annie Wunder, who also was arrested last night at 13 Decatur street, because of what the police learned from Harry Hunt, was arraigned in the women's session before Judge Sullivan on a charge of receiving stolen property and was held in $1,000 for the grand jury.

Among the goods captured was a lot of gold from the Boston Dental Laboratory Co., worth $500.

Lancaster, Pa., Feb. 21.—Thieves entered the office of Dr. D. H. Nissley, a dentist, and took a quantity of gold and platinum valued at several hundred dollars. The dentist was out of his office less than ten minutes. It is within two hundred feet of the City Hall.

Altoona, Pa., Feb. 23.—An unknown robber entered the dental offices of Dr. J. C. Nugent in the Casganave Block at noon today and after jimmying the door in the safe and blowing open two inside doors, was frightened away before securing $500 worth of gold in one of the drawers.

The plucky wife of Dr. Harry W. Ferguson, New York, captured a pair of burglars in the dumb waiter leading into the offices from the basement, on March 10. They will be kept out of mischief for some time.

Carroll, Ia., March 9.—Dr. A. F. McCreary's dental office in the Masonic Temple block was broken into last night and gold to the value of about $20 stolen.

DENTAL TROUBLES.

Pittsburg, Pa., March 5.—Dr. Robert Speare is the new leader of the jail church choir. The dentist yesterday was sentenced to jail for a year, at the request of Wardon Edward Lewis, by Judge Joseph M. Swearingen. Speare originally was convicted on a serious charge and sentenced to serve four years in the workhouse.

He was granted a retrial and pleaded guilty to a charge of misdemeanor. Then the warden stepped in. He wanted Speare, who is a singer and sang at one time in a college glee club, to be sent to jail instead of the workhouse. The warden said he could attend to the prisoners' teeth and also lead the church choir. Today the dentist will fill his new position.

Drs. Moody & Moody, Minneapolis, were burned out March 8 by the fire that destroyed the Syndicate building. After the fire the safe was opened and gold leaf to the value of several hundred dollars was found uninjured.

Columbus, O., Feb. 16.—George F. Feuerstein, dentist, was arrested Wednesday on the charge of illegally practicing. The affidavit was sworn by Louis Yonker, secretary of the state dental board.

Dr. J. M. Henderson, a prominent dentist of Columbus, Ohio, has been tendered a federal position, having been appointed a member of the U. S. Assay Commission.

Charles Skusa, an alleged dentist, was arrested at Brazil, Ind., March 6, on the charge of practicing without a state license.

Dr. Chalmer E. Camp, of Massillon, O., is charged by the State Board with employing an unlicensed assistant.

Dr. E. S. Holmes.

Grand Rapids, Mich, Feb. 25.—Among the members of the Old Settlers' association of the Grand River Valley, who gathered at the Morton house last evening to celebrate the annual banquet, was Dr. E. S. Holmes, one of the first practitioners of dentistry in Kent county and Western Michigan. The doctor is completing his ninety-first year and will enter upon the ninety-second July 15.

Born in Wilson, N. Y., in 1819, the doctor moved to Lockport in his early youth and began practicing dentistry when but 24 years of age.

In the fall of '65, he came to Michigan and established an office in Grand Rapids, where his brother, Judge Holmes, had preceded him 37 years before. In 1890 the doctor became a member of the association, following a residence of 25 years in Western Michigan, one of the requirements for membership. Since his admittance to the association the doctor has been very active in its behalf.

Dr. Holmes' established the E. S. Holmes Dental club some years ago, under whose auspices several lectures of importance have been given of late.

Information has reached us to the effect that some of our friends are being victimized by a bogus solicitor, supposed to be deaf and dumb, who is going about in certain sections in Kentucky securing subscribers for THE SUMMARY, collecting the amount, and, of course, failing to forward it to us. It would seem to be a pretty good rule to require some identification on the part of strangers before entrusting them with hard-earned cash. If dollars grew on wild grape vines, the case might be different; but they don't, not here in Ohio, anyhow, whatever the case may be down in the Blue Grass. The writer "was born in old Kentucky, where the meadow grass is blue," and, therefore feels a special sympathy for all the good fellows down there, who would rather lose a dollar than fail to help one who needed help; but benevolence is one thing and to be "skinned" is quite another. Better send in your subscriptions direct. That method will cut out at least one chance of loss.

Dr. Frank E. Williams, formerly of Grand Rapids, Mich., is now located at Sixth and Hill streets, Los Angeles, Cal., where it is hoped he will meet with a full measure of success.

The Mississippi State Convention

The Mississippi State Dental Association will hold its eighteenth annual session in Hattiesburg, May 9, 10 and 11, 1911. A fine program has been arranged and the co-operation of all ethical dentists is desired. L. B. Price, Sec., Corinth, Miss.

Back Numbers Wanted.

Any of our readers who have any numbers of Volume 22 or 23 of THE DENTAL SUMMARY that they are willing to part with to aid the College of Dentistry of the University of California will confer a favor by sending a list of the numbers to Dr. Robert E. Keys, librarian, San Francisco, Cal.

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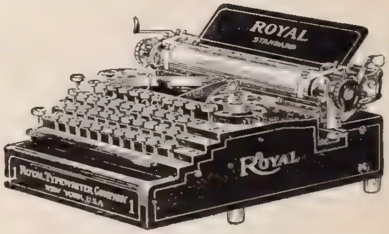

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THE DENTAL SUMMARY

The Magazine That Helps

Vol. XXXI MAY, 1911 No. 5

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The Indiana State Dental Society
The Kentucky State Dental Society
The Louisiana State Dental Society
The West Virginia State Dental Society
The Northern Ohio Dental Society
The Northern Indiana Dental Association
The Eastern Indiana Dental Society
The Southwestern Michigan Dental Society
Odontological Society of Western Pennsylvania
The Lake Erie Dental Society

and Several Local Dental Societies.

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L. P. BETHEL, M. D., D. D. S., Editor-in-Chief

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REGULAR CONTRIBUTIONS

RETENTION OF DENTURES WITH SPECIAL REFERENCE TO THE BAR*

By Edward C. Mills, D. D. S., Columbus, Ohio

THE retention of a denture in such a manner as to procure the happy combination of utility and esthetic effects, whereby we have a harmonization of features, is the great desideratum in the prosthetic branch of our profession.

An expression of satisfaction from a patient touches a sympathetic chord in the bosom of the operator, but the pleasure of that response is measured only by the degree to which he, in his own judgment, has successfully administered to the essential requirements of the case.

It is not my purpose in the brief compass of this paper to consider the subject of retention in its entirety; suffice it to say that any method of retention is based upon the laws of physics, such as atmospheric pressure, adhesion by contact, leverage, tenso-friction and adhesion or cementation. A consideration of their practical application from the able pen of Dr. G. H. Wilson is published in the "Transactions of the National Dent. Assn. for 1909." Accepting this author's classification of these forces that perform their function in the matter of retention, the application of the bar would be included in the fourth class, that of tenso-friction, where retention is obtained by contact, with remaining teeth.

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*Read before the Indiana State Dental Society, 1910.

Regardless of the ravages of caries, trauma, pyorrhoea, and the toll exacted for the neglect of the full complement of teeth in the human mouth, it is indeed a small per cent. of the edentulous cases that become such from these causes alone. On inquiry we learn that from perhaps one to several teeth that had withstood the fate of their neighbors, succumbed to the pernicious use of the forceps, causing an irreparable loss of teeth that by therapeutical or prophylactic measures might have served years of usefulness, if not throughout the remaining years of life.

It is the purpose of this paper to call attention to some expedient whereby these exigencies may be met; a method properly employed, instead of working to the detriment, should, from a physiological standpoint, be conducive to the durability of the teeth, tooth or even a root to which our retentive force is applied.

A histological examination of the peridental membrane shows it is composed largely of inelastic fibers, the attachment of which to the cementum and process is most secure, penetrating the cementum to the dentine, and the substance of the bone—in fact the bone seems to have been deposited around the fibers. The arrangement of these fibers varies in different portions along the root of the tooth, and their effect on tooth movement is well known.

About the neck of the tooth they are almost at right angles with the long axis of the tooth, passing outwards, some blending with the fibrous tissue of the gum, and others blending with those of the adjoining teeth forming the dental ligament. At the beginning of the alveolus the fibers are at right angles to the tooth, attached to alveolus at points nearest the cementum, others pass over to form attachment with the outer surface of the alveolus, making the strongest possible attachment to prevent *lateral strain.* Immediately within the alveolus, for a short distance, they continue at right angles, but then slightly incline in an apical direction, becoming more oblique as the apex is approached, thus serving to suspend the tooth into its socket—accounting for the fact that *depressing* a tooth in its socket is the most difficult tooth movement known. Near the apex the fibers take a more or less horizontal direction and at the apex their course is at right angles to the surface.

While great numbers of fibers in this membrane take a direct course from the cementum to the alveolus, others pass over at different angles, while still others curve laterally, especially at the angles of the root, offering great resistance to the *rotation* of the root in its socket.

From this arrangement, so complex, experience has demonstrated that the following tooth movements, in order named, are the most difficult to perform: depressing, rotating, lingual and labial movements, and elevating a tooth in its socket. In view of these facts, not only based on our knowledge of the histology of the tissues, but firmly established by clinical experience, it is reasonable to conclude that a force acting in a line, or direction, against which the tissues have the greatest power of resistance, is far less detrimental than if acting in a more vulnerable direction. The experiments carried on since 1894 by Dr. G. V. Black show the resistance or masticating force to vary from 75 to 275 pounds, averaging about 170 pounds. Many whose power of bite was 40 pounds, owing to inflamed conditions of the gums or peridental membrane, were, after treatment, advised to use their teeth vigorously during mastication, and as a result of this increased pressure, their bite ran up to 170 pounds, illustrating very forcibly the healthful influence of enforced pressure on the peridental membrane. The employment of this principle has stimulated greater interest in methods of retention and to the late Dr. J. B. Beauman credit is due for introducing the method of retention now known as the Beauman Anchored Denture. After many years of practice, during which he wrestled with the perplexing problem of adjusting a lower plate that would give satisfaction to himself and comfort to his patient, he devised this system and gave it to the profession in 1906. Its use creates enthusiasm, and had it come to the profession as a patented method, for the use of which a royalty would be exacted, there is little doubt in the mind of the writer but that its use would be more universal.

The construction of this method has been fully described in THE DENTAL SUMMARY for November and December, 1906. It is applicable in those extreme cases where but three, two or even one tooth remains.

The process consists in devitalizing the teeth or tooth to be used as an anchor, and prepare the same as for a Richmond crown; after forming the cap enlarge the canal for the accommodation of the pin—these being placed in position an impression is taken and a model prepared composed of plaster and any of our investment materials. A square iridio-platinum bar 15 gauge is now bent to conform to the cast, the ends extending upon the tops of the caps, and this framework soldered together. If but one root is used for the anchorage extend the bar distally and mesially. The framework, after final polishing, is placed in position; a bite is now taken, a plaster impression made, and the framework placed in proper position; a plaster model is made, placed on the articulator and proceed to wax up in the usual manner. In packing it is unnecessary to cover the framework with tin foil, as it is easily removed from the vulcanite, though requiring some patience and care. After trying in the framework, adjust the denture, and if the adaptation to the anchor and gums is perfect, cement in the anchor, insert the plate and after the cement is set, the retention will be found to surpass your expectations. While adhesion by contact may play a part in this method, due to the condition of uniform pressure and absolute contact of the plate and the gums, the major factor is the friction due to the accurate fitting of the framework in the vulcanite.

This method has been in use by the writer since 1905, and where three, two or even a single root is supporting a denture, the results have given uniform satisfaction.

The model, showing but one tooth (Fig. 1), the lower first bicuspid, represents a case inserted June 21, 1906, a patient then in his 70th year. A recent examination shows this tooth as firm as when the denture was first placed in the mouth.

In each of these cases the pressure on the root and gum is equally distributed, and as far as the roots are concerned is in the direction against which nature has strongly fortified the teeth, by the suspensory fibers of the peridental membrane, namely against the stress of mastication.

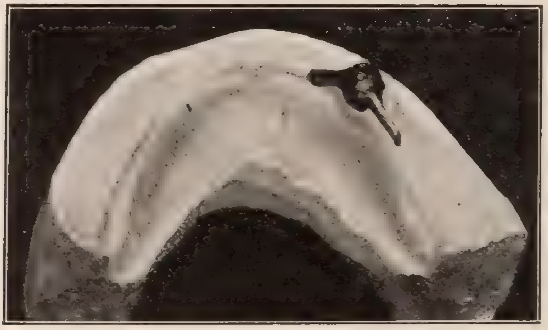


Fig. 1.

In any form of retention coming under the tenso-friction class, certain elementary forms of mechanism, or mechanical powers, become important factors, certainly as far as the durability of the point of anchorage is concerned. The acceptance of this term implies the condition that an advantage is gained by the use of one of the elementary machines, such as the lever, or in other words, that a small force acting through a given space may be made to overcome a greater force acting as a resistance, through lesser space. We have a practical demonstration of the results of this principle where the leverage, or lateral pressure, brought upon a tooth by a clasp to retain a plate, or a cap to support a bridge, has impaired the stability of the tooth; this force being in direct ratio to the proportion of tooth above the gum.

Measurements of many teeth of each denomination have been made so as to insure reasonable accuracy as to average size. To illustrate the leverage or lateral pressure we will select the lower cuspid, the average length of which is given as 25.6 millimeters or 1.01 inches. Length of crown, .40 and of root, .60. The resistance required to loosen a tooth in its socket varies; no instrument has been devised or accurate experiments made to calculate what would be the average resistance of a tooth, but for convenience of illustration we will place it at 90 pounds.

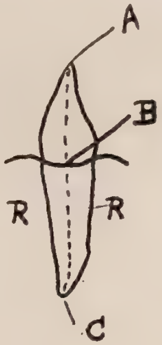
Using the lever as our mechanical power, assume the fulcrum to be a point at the union of the crown and root, the power arm, from this point to the apex of cusp, the weight arm from the fulcrum to the apex of root, the weight, or the resistance of the root, 90 pounds, and the power or lateral pressure by X.

Apply one of the laws of the lever in the following proportions:

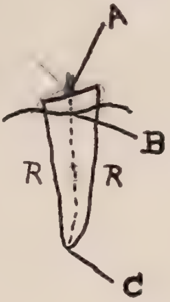
Power Arm : Weight :: Weight Arm : Power. By substitution we have: .40 : 90 :: .60 : X, hence 54=X .4 :X=135, or 135 pounds pressure to displace the resistance, when the crown is of average length. After preparing the tooth for abutment as advocated for this anchorage, the crown or power arm is considerably diminished, say to one-fourth its original length, or to .10.

Then our proportion is as follows: .10 : 90 :: .60 : X, hence 54= X .1 : X =540 pounds, or 540 pounds pressure to overcome the same resistance that 135 pounds would do with the crown its normal length.

While these figures seem incredible they prove conclusively that a tooth prepared in this manner is infinitely better fortified against leverage or lateral pressure. A practical illustration is the increased difficulty by which a root is removed when the crown has been broken off at the gum.



AB—Power Arm .40.
B—Fulcrum.
BC—Weight Arm .60.
RR—Resistance, 90 lbs.



AB—Power Arm .10.
B—Fulcrum.
BC—Weight Arm .60.
RR—Resistance, 90 lbs.

Inasmuch as the appreciation of the value of the teeth increases proportionately with the loss of these organs, the suggestion of removing all remaining teeth, save such as would be necessary for the Beauman Anchored Denture, becomes a serious proposition in the mind of the patient. Being familiar with the unsatisfactory results others have experienced with partial dentures, especially where only the six anterior teeth remain, they eschew Fletcherism, continue bolting their food and read irony into the lines of the Bard of Avon:

> "Now good digestion wait on appetite, and health on both."

To supply the requirements of these cases in a manner that would overcome the deleterious results which follow in the wake of the clasp, led to some experiments in which a bar might be used without sacrificing the remaining teeth, and give the denture a stability not obtained when supported entirely by the soft tissues of the mouth. To compare its relative efficiency to a clasp, a lower case, represented by the model (Fig. 2), was selected. On the left side the teeth distal to the first bicuspid were missing, and on the right the first molar was in a broken down condition with nothing distal to it.

A clasp was formed for the bicuspid, and a gold shell crown, to which was soldered a square iridio-platinum bar, extending distally, was prepared for the molar. These were placed in position in the mouth, a plaster impression taken, a model prepared with the band and cap in their respective positions, from which was made the denture—the bar fitting in a receptacle in the vulcanite. The cap was then cemented in its proper position, the plate inserted and pressed firmly in position until the cement had completely set. The retention on either side seemed uniform, but you may imagine my chagrin when some weeks later the patient returned, complaining the side retained by the clasp was not as efficient as that with the bar. The bar afforded a secure fixation and a support, which prevented the play on the soft tissues of the mouth, with the resultant friction, the effect of which from the clasp, had already produced some sensitiveness.

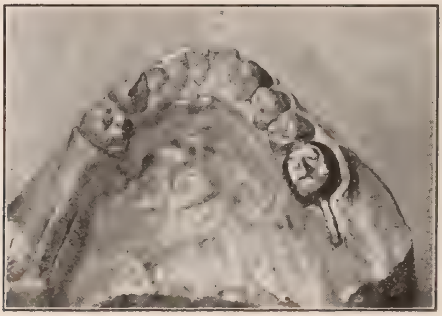


Fig. 2.

In subsequent cases, in which retention by a bar was intended, the clasp was dispensed with entirely.

With attention to details, there is, in the mind of the writer, no operation in dentistry so gratifying to the patient, or productive of such satisfactory results at the expense of minimum skill, as bar extension for retention. It is of great importance that the gums are in proper condition, in that the process of absorption is complete. If an ordinary plate is worn during this period it will quicken an appreciation on part of the patient for your later efforts.

With all useless teeth and roots removed and the gums in proper condition, select such roots or teeth to which attachment is to be made. If teeth are to be used it is preferable that their axis be near parallel that the finished denture may with greater convenience be placed in position. The bar can be attached to any form of crown where metal is used in the construction, to the various invisible attachments used in bridge work, or where conditions warrant, to a gold inlay.

The attachments for the bars prepared, they are placed in their proper positions and a plaster impression taken. Should the attachments fail to come away with the impression, use the same care in placing them in their proper positions as with the abutments for a bridge.

In pouring the cast use equal parts plaster and tenax, or any of the ordinary investment materials.

A square iridio-platinum bar, 15 gauge, varying in length from one-fourth to one-half inch, as conditions will permit, is bent to conform to the cast, extending mesially or distally from the attachment. A tendency for the plate to be displaced backward, due to a flat arch and little natural retention, may be overcome by cutting a square notch in the bar. It might be well to emphasize at this point that the bar should be *iridio-platinum and not platinoid*. This latter metal is an alloy of German silver and 1 or 2 per cent. of tungsten, an element which gives this alloy its high fusing qualities. Platinoid deteriorates in the mouth, and in the course of time a mere ribbon of metal remains instead of a perfectly square rigid bar, upon which the retention depends entirely. For one to resort to such economy is to stand in his own light, and unless sufficiently compensated, or imbued with an altruistic spirit, to use the material upon which we must depend for success in this work, do not attempt it.

The bar is not to impinge upon the soft tissue, nor is it necessary to trim the cast except for imperfections. With one end in contact with the abutment it is held in position with a drop of wax, while the other end is covered with some investment material which retains the bar in proper position, when the wax is removed and the end of the bar securely soldered to the abutment.

When the length of the bite permits, two bars of equal length, after being fitted to the cast, are placed, one on the other lengthwise, and soldered, after which they are soldered to the abutment, thus making a deeper receptacle in the vulcanite and giving increased surface for retention. When the bite is close, the bar should be placed far enough lingually, if possible, so as not to interfere with arrangement of the teeth.

The lateral surfaces of the bars should be as parallel as possible, and can be made so without the use of the ordinary paralleling device, by comparing these surfaces carefully when the bars are waxed to their respective abutments. After soldering, the abutments with bars now attached are polished, placed in the mouth and the bite is taken. After a plaster impression, using the same precaution as before, a plaster model is made with the bars and abutments in their proper position. If a metal plate is to be made, after swaging, slots are cut for the accommodation of the bars. It is then placed in position in the mouth, and in the absence of suction is retained by use of powdered gum tragacanth while the impression is taken. The model prepared, remove any portions of plaster adhering to the bars, place on articulator and wax up the teeth in the usual manner. In lower cases, where, owing to elongation of the upper teeth, the bar interferes with placing the teeth in proper position, swage a gold dummy as used in such cases in constructing a bridge and with a spur for the attachment of the vulcanite, the difficulty is readily overcome.

After investing, cover the cast with No. 20 tin foil or any material desired, but do not cover the bars—their adaptation to the rubber should be perfect, and this object is defeated by the interposition of any substance. After vulcanizing, remove any rubber covering the under surface of the bar, when by patient and careful manipulation the bar can be easily removed from the plate, without change of form.

The case is now finished and with the abutments in their proper positions in the mouth, the denture is inserted and the adjustment will be found exact. The parts are now removed and the abutments cemented permanently to place, the surplus cement is removed, the denture inserted and pressed firmly against the gums until the cement has firmly set. If, when the denture is removed and the anchorage seems so firm as to inconvenience the patient, do not trim the receptacle for the bar; the binding will usually be found at some other point.

Should the anchorage be desired more secure, the friction can be increased, by first inserting the plate in plaster, exposing the grooves, and after warming, with a burnisher of a diameter slightly greater than the width of the groove a slight pressure will produce the desired result. This has been resorted to by the writer in two cases, in which tin foil had been placed over the bars before vulcanizing.

In this form of retention we have a sufficiently rigid fixation with the least possible sacrifice of tissue. The pressure is evenly distributed over the bars and soft tissues of the mouth and the denture is given a stability against the constant wear and consequent injurious effects on the remaining teeth.

The clasp is eliminated and we are not confronted with the injurious effects that follow its use—resulting eventually in the loss of the tooth to which it is attached. That portion of the gums encircling the necks of the teeth, the gingival ligament, by this method, suffers no injury; the normal interproximal spaces continue to be filled with healthy gum which protects these otherwise susceptible areas from the encroachment of decay. There is no conventional form to be given to the denture; it may be of the crescent shape, or be made to cover only certain portions of the mouth, a matter of considerable moment so far as speech and the sense of taste are concerned.

The question as to the amount and result of the force operating on the teeth to which attachment is made is a matter of some interest. Experiments show that with a plate of artificial teeth it is not possible to produce the same amount of force as with the natural teeth, owing to pain induced by pressure of the denture against the gum, rather than to a condition of muscular strength. This pressure, which is about 50 pounds, would be increased somewhat with the bar retention, as the bar would relieve the gums of considerable stress.

This downward pressure, for reasons assigned elsewhere in this paper, is not without benefit on the teeth serving as abutments. In the model

(Fig. 3), the upper right cuspid was somewhat loose with a tendency to pyorrhoea; an examination made recently shows an improved condition, as a result of the service during the past eight months.

The question of leverage caused by the downward pressure is inconsiderable. Regarding the bar as a lever, a force acting in this direction would be without any advantage, as the arc through which the power arm could act would be determined entirely by the inequality of pressure on the bar and gums. Should this condition exist an equilibrium would soon be established as shown on the model (Fig. 4). The molar to which a bridge was formerly attached had become quite loose and by a slight inclination has accommodated itself to this pressure. When we consider the extensive tooth movements accomplished by the orthodontist, the general practitioner should be immune to criticism for causing this limited change of position, unaccompanied by any injurious results.

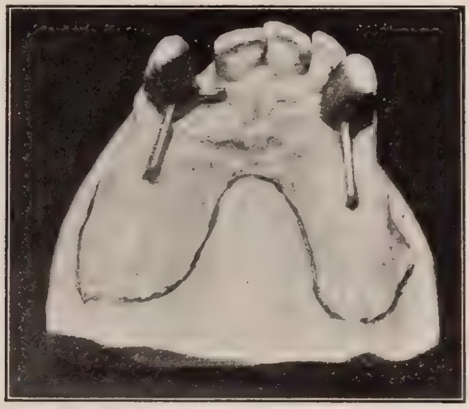


Fig. 3.

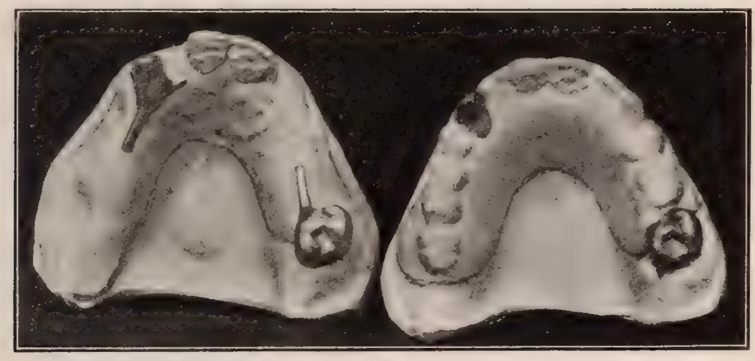


Fig. 4.

The lateral pressure against the bar is not as formidable as it would be against the abutments of a lateral bridge, because the attachment is reinforced not only by the bar attachment on the opposite side, but the adaptation of the denture to the remaining teeth, the roof of the mouth or uneven surfaces of the gums.

From personal experience, and reports of a variety of cases treated by this method of retention, it seems safe to predict possibilities in the use of the bar in this branch of dentistry.

In the hands of the writer it has proven invaluable, especially so in treating those cases, where despite our most strenuous efforts, we have blushed at our calling, and "thus repulsed, our final hope is flat despair."

DISCUSSION.

Dr. C. I. Keely, Hamilton, Ohio: Dr. Mills has given us an excellent paper and could you be as fortunate as I in seeing some of his cases where he has used this bar anchorage, I am sure you would be as enthusiastic in its use. Partial plates have always been a bugbear to me, particularly those of the lower jaw. When we have, say the six anterior teeth standing, with clasps and some of the other numerous anchorages, I have had gratifying results, but in many cases at the expense ultimately of the natural teeth, but I can honestly say nothing has ever given me or my patients the satisfaction as have the plates made with the bar anchorage. This will also apply to full dentures when roots of two teeth are used for the bars, or even when you have only one tooth available.

Having worn these plates, I feel in a position to speak on the advantages to be derived from them. The satisfaction I have derived in my own case has been far beyond anything I had hoped for or expected. "Experience is our best teacher," and my experience with them has suggested some improvements which I have used in the few plates I have made and find they have worked to good advantage.

The notch mentioned by Dr. Mills as used in my case to prevent the plates from slipping back has not proved satisfactory. It answered all right at first, but the rubber in the botton of the slot soon wore smooth, when the effect was gone. This trouble can be prevented in several ways. In place of setting your bars straight with the ridge, let them diverge just a trifle, or on the latter third of the bar broaden it a little, or, as I have done in two cases, solder a small piece standing upright on the end of the bar; this I have found to work very satisfactorily.

Dr. W. H. Todd, of Columbus, used a clasp as well as the bar, which he claimed was a helpful guide in putting the plate to place and is also a help in its retention as well as a prevention to its slipping back. However, you will not have this slipping back tendency to any extent, except where you have a very flat mouth or ridge. But when this condition exists it is very annoying to the patient.

Now in all plates we have (as we tell our patients) a settling to place. I would suggest that before setting the crowns permanently you give the top of the bars two or three rasps with a file; this will give you enough space between bar and plate so that when the plates have settled to their place there will be no strain on the bar and tooth.

Dr. Mills insists on having his plates held very rigid in place. From my personal experience I can not agree with him. When I left his office my plates were so firmly in place it was with the greatest difficulty that I could remove them. I stood this for a few days, when I loosened them some, and I find while not so difficult to remove or put to place, still they are just as satisfactory in mastication as they were before I loosened them. A plate held firmly in place, that does not move in masticating one's food, is all that can be desired, and is one which will not cause a strain on the remaining natural teeth.

Dr. Mills says not to put tin foil over the bars; I do not agree with him, for I find by covering them with No. 10 foil I get just as good results as without.

Dr. D. A. House, Indianapolis: I wish to compliment the essayist on his excellent paper, as it is most complete and decisive in detail and shows the results of hours of most careful work.

His description of the anatomical support of the tooth in its socket is very minute and he thereby shows why a tooth will resist certain forces while it readily yields to others.

While I have had no experience in this particular method of attachment for dentures, it appears to me as a very practical and satisfactory manner of support. I had the pleasure of seeing a case of this kind in the mouth today and a careful examination led me to these conclusions, viz.: First, it allows a firm and rigid retention of the denture. Second, practically no movement when in place. Third, very little effort for its removal, and consequently very little effort for its replacement.

I want to thank Dr. Mills for his most excellent paper on a subject that receives far less attention than one of its importance should receive.

Dr. Fred A. Prow, Bloomington: The method of retention presented by the essayist has impressed me as being most excellent, but not having tried it or previously seen it until the examination of the practical case to be presented at the clinic, there is little for me to say from personal experience or observation.

The method was excellently described by Dr. Mills, and we have appreciated the privilege of listening to his paper, and also of seeing the method in a practical case.

The mechanical idea of retention with minimum of strain on teeth to which attached no doubt appeals to all of us.

Dr. J. P. Carmichael, Milwaukee, Wis.: The essayist has shown us very clearly why teeth will stand the stress we so often require of them in substituting additional masticating appliances, and I like the way he presents the subject. We have often noticed that by connecting a number of loose teeth in the support of bridgework, that they will endure a great deal more stress in mastication than they would when subjected to a motion that will rock them in different directions.

I have seen some of Dr. Mills' work and I know he is an artist in this particular line; and to accomplish these operations requires skill and nicety of adjustments. There are cases in which this denture no doubt is a great success, and I believe that they are most suitable in those cases where we have, for instance, two or three teeth on the lower jaw. In such a case it is possible to anchor your denture and allow for the case to settle under the stress of mastication, without changing the articulating plane.

The Doctor claims in his paper that this plan will divide the pressure so that the force of mastication will come partly upon the gum and partly upon the bar. Now I do not believe it possible to do this and that we must depend entirely upon one or the other; if we depend upon the gum, we must expect more or less shrinkage; whereas if we depend upon the bar, there is a great strain upon two or three teeth, and in a short time a tilting motion.

Let us take for example the case he cites, where the only remaining natural teeth are the lower six anterior; for this patient we are going to make a full upper artificial set and substitute grinders on the lower jaw. Now we all know how essential it is to have a strong, firm occlusion of the molars, if we expect to secure a good fitting plate to the upper jaw; and if the lower denture settles, then we have the force exerted entirely against the front teeth, which we know will move the upper plate from its proper position, and we soon have a very ill-fitting plate. Then if we depend upon this frame-work to hold the partial lower denture to the position, as we would first have it adjusted in the mouth after shrinkage of the gums, the two teeth anchorage would not be strong enough and I would expect trouble.

I have therefore taken a somewhat different course in many of those cases where he would apply this particular denture, for instance, this same case where we have the remaining six anterior teeth on the lower jaw.

I have been successful in substituting teeth in these cases, in a manner that I term extension bridgework; I would make one of my patent attachments for each of the remaining natural teeth, solder them all together and carry from this support an extension of three teeth on each side; this bridge is cemented in place and it is a serviceable, lasting operation; the fact that all these remaining teeth are brought into service and the stress of mastication being in that direction to which they have always been subjected, makes them wonderfully strong in support of such a denture.

In a case of this kind I would not depend upon the gum for support, but would make an oval surface beneath the bridge teeth to rest upon the gum that it might be easily cleaned.

Now we will say that if I had this same case with a molar on one side, it would not be necessary to make an attachment to all the anterior teeth, but connect the two sides with an iridio-platinum bar, which will give the required support for the extension to be made for the one side.

The very same principle is applied here as Dr. Mills argues, only where he would use about two teeth to steady his denture, and would depend upon the gum for support, I would use all the remaining teeth and make my denture independent of the gum.

In those cases where we have but one or two teeth remaining, he would certainly have the advantage of me, but if there were three or more I would tackle the fixed bridge.

Dr. E. C. Mills (closing discussion): At the 1907 and 1909 meetings of the Ohio State Dental Society, I exhibited as a clinic, models of cases showing the bar for retention, but became convinced that to excite any interest in this work it would be necessary to show a case in the mouth. This was done at the 1909 meeting, and our good friend, Dr. Keely, became interested to the extent of having the work done that has been presented. I considered it a most fortunate opportunity to have a man of his ability as a patient, knowing that many suggestions with his technical experience would be valuable in overcoming many difficulties I had been contending with.

Dr. Keely has had personal experience in testing the efficiency of this retention, and I wish to take this opportunity to thank him for the expression of enthusiasm he has made relative to it. It is hardly possible that without the aid of some paralleling device these bars could be placed so perfectly parallel as to permit the plate to slip backward: the notch cut in the bar was an after thought and the suggestion of Dr. Keely of broadening the free end of the bar, or where the bite permits of soldering a piece to it, is one I have followed with good results in a case since. A close adaptation of the sides of the bar to the vulcanite is the great desideratum, and this can be best obtained without the interposition of tin foil between the bar and the rubber in vulcanizing. It was my practice to use the foil to facilitate the removal of the bar, but I found the rubber does not adhere to iridio-platinum any more than to tin foil, so have abandoned it. The difficulty of removing the plate from its position in the mouth is often due to such binding as we often experience in placing an ordinary rubber plate and is usually remedied by easing off these points, and seldom if ever necessary to carve the receptacle for the bar.

Dr. Carmichael calls attention to one point I wished to emphasize in the paper, that the teeth will stand the stress better by increasing their masticating facilities—that is by bringing the pressure in a direction they are fortified to withstand. The ordinary clasp has no occlusal rest, and we frequently find a tooth with a clasp attachment elongating and eventually expelled from its socket, simply due to want of stress in the proper direction. No doctor doubts the possibility of equalizing the pressure of the denture on the bar and soft tissues. It is an observed fact that absorption continues indefinitely in mouths where a plate has never been worn, while in many cases the absorption almost ceases when a plate is introduced, and we frequently find a close fitting plate after a period of many years. It has been my practice not to use this form of retention until the absorption has progressed until the gums have become sufficiently firm, and I can feel reasonably sure that further absorption, if any, will be a minimum amount, and any subsequent settling of the plate will be taken care of without injury to the teeth attached. This is a fact from experience, as an examination of mouths in which these attachments have been used for some three years we find the same condition of the soft tissues due to pressure of the plate as found in cases where the ordinary clasp plate is worn.

This settling can be provided for in dressing off the top of the bar, as suggested by Dr. Keely, though if left to the tilting of the teeth it would be so slight no unfavorable results need be feared. The Doctor's method of substitution by extension bridges is not without its merits, *provided* the support is adequate, otherwise he had better "tackle" a plate with bar retention.

I desire to thank Drs. Prow and House for concurring with some of the points I have tried to bring out in my paper.

I appreciate the honor of being a guest of the Indiana State Dental Association, and desire to express my thanks for the manner in which my paper has been received. Our common purpose is to administer to the wants of our fellow men, and no doubt we all are often harrassed by adverse conditions in bringing to them the comfort we desire. If my paper will encourage any of your members in this line of work, I feel they will be enthusiastic with the results.

RETENTION OF DENTURES WITH SPECIAL REFERENCE TO THE BAR*

By Charles I. Keely, Hamilton, Ohio and Edward C. Mills, Columbus, Ohio

THIS clinic, with patient and models of cases, was presented to demonstrate a paper under the above title read at this meeting.

Models shown in Fig. 1, mounted on articulator, represent the mouth of the patient (C. I. K.) before operating, showing the upper six anterior and first left bicuspid, and the right lower anterior, excepting the left second bicuspid, remaining. The upper centrals and left cuspid were extracted on account of pyorrhea, and the remaining teeth prepared for crowning as shown in Fig. 2. Owing to mechanical abrasion the bite was opened fully a quarter of an inch; Fig. 3 represents the lower prepared for crowns, Fig. 4 represents the remaining upper teeth crowned, the centrals and left cuspid restored by bridging, and two iridio-platinum bars extending distally from the upper right cuspid and left bicuspid. In soldering this piece, in order to give a fixed bite for the lower incisors,

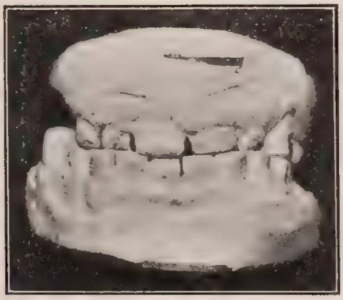


Fig. 1.

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*Clinic at Indiana State Dental Society, 1910.

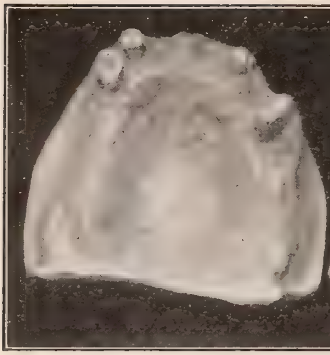

Fig. 2.

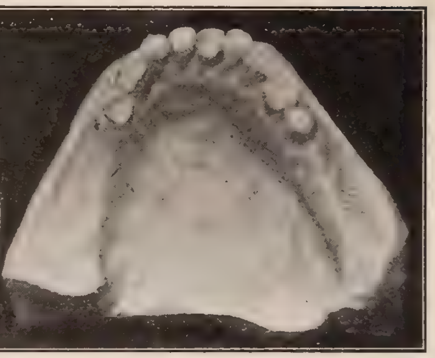

Fig. 3.

a half-round iridio-platinum wire was placed on the lingual surface, near incisal edge.

The lower incisors and cuspids were lengthened by fillings and inlays, the distal bicuspid on either side was capped and two iridio-platinum bars were fixed distally as represented in Fig. 5.

Fig. 6 represents the palatal surface of the upper gold plate, showing the receptacles in the vulcanite for the bars; Fig. 7 the lower plate with like receptacles for the lower bars.

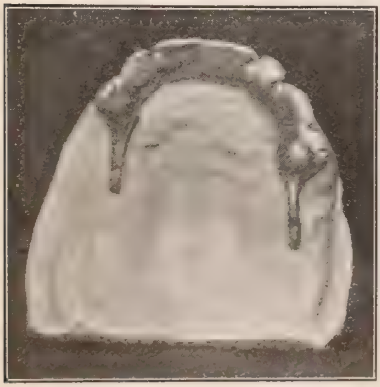

Fig. 4.

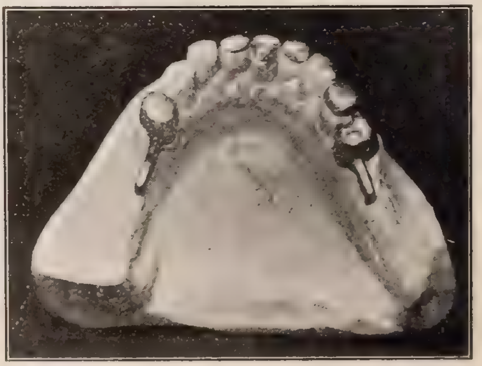

Fig. 5.

Figs. 8 and 9 show the plates in position. The bar connecting the lateral halves of the lower plate is a square iridio-platinum wire, over which 20-k gold solder was flowed, giving it the round shape and thus making it more congenial to the tissues. When the tongue is in repose

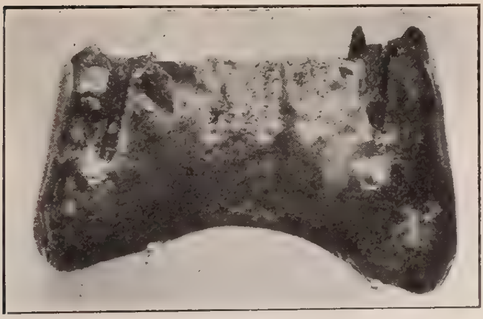

Fig. 6.

the tip rests against the lingual surfaces of the lower incisors near the gingival ligament, leaving a space between this point and the floor of the mouth, which readily permits the use of a bar in this location and obviates the deleterious results of having the plate touching the lingual surfaces of the remaining teeth. Placed a little above the muscles forming the floor of the mouth and in easy relation to the gum tissue, the patient is unconscious of its presence, and his comfort is correspondingly increased.

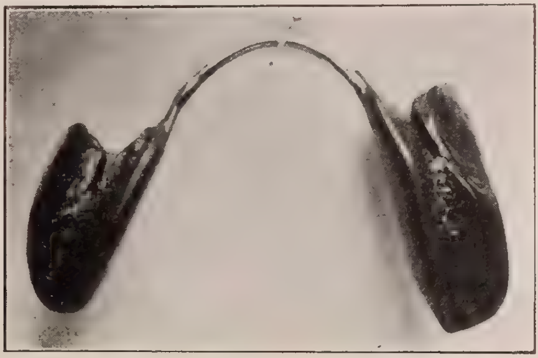

Fig. 7.

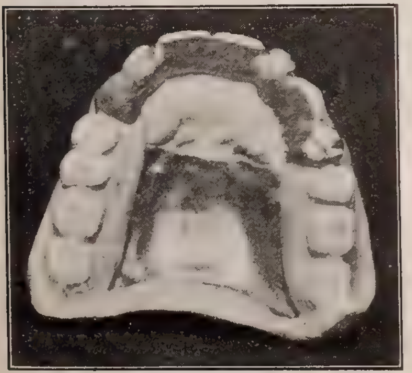

Fig. 8.

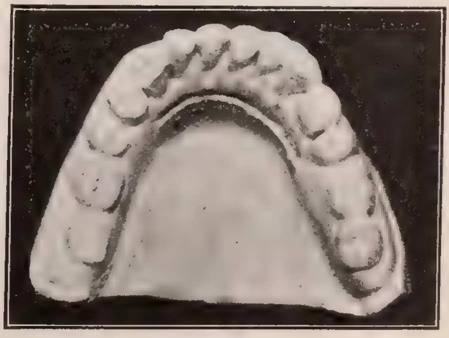

Fig. 9.

This case was inserted March 20, 1910, and the practical benefit obtained in this short period has made a marked change in the patient's general health. It is worthy of note that the plate does not extend over the anterior portion of the mouth, and does not interfere, therefore, with either taste or speech.

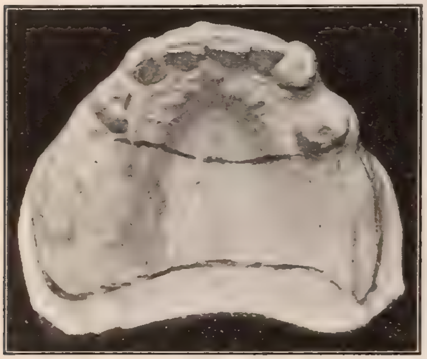

Fig. 10.

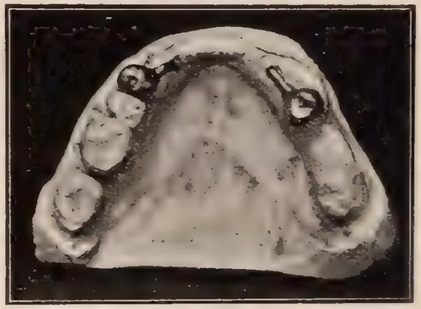

Fig. 11.

Fig. 10 represents a case where the lower incisors in occlusion touched the gum lingually to the upper anterior teeth. Crowns were made for the second bicuspids on either side, with bars extending distally; owing to the close bite the first left bicuspid was bridged to the second bicuspid. The shape of the denture is outlined on the model.

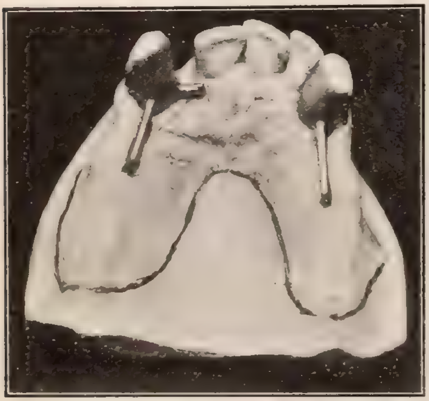

Fig. 12.

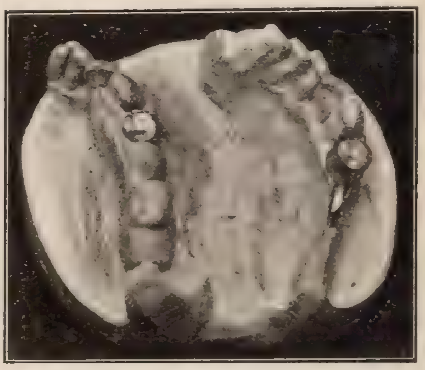

Fig. 13.

Fig. 11 represents a case in which the lower incisors, cuspids and molar were restored, April 12, 1910, for a gentleman who is now in his 76th year. While the teeth to which attachment was made were loose, in common with the other remaining teeth they have shown marked improvement.

Fig. 12 illustrates one of those cases where to insert a denture brings discomfort to the patient, and usually a disappointment to the dentist.

This case was inserted September 4, 1909, and the only professional visit made since was to have the mouth looked over previous to the last meeting of the Ohio State Dental Society, where the patient presented himself at a clinic. Touching the comfort these patients enjoy it is only necessary to state that they seem to require no subsequent attention.

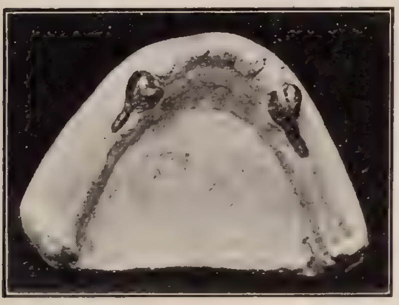

Fig. 14.

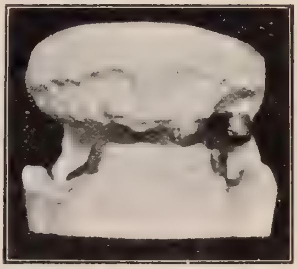

Fig. 15.

Fig. 13 represents a case in which Dr. Keely has ingeniously combined the bar extension with a clasp in a bridge. The first lower bicuspid was crowned with a bar extending distally; vulcanite carrying the second bicuspid and first molar with a clasp fitting the capped first bicuspid was made and is shown in position on the model.

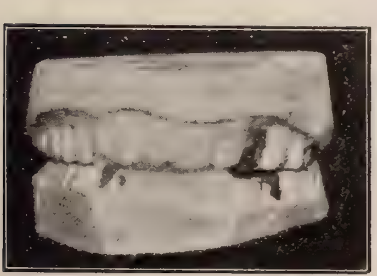

Fig. 16.

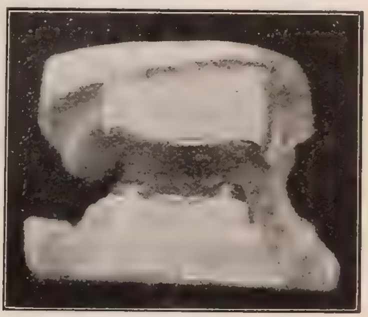

Fig. 17.

Fig. 14* illustrates a case with bars extending distally from the bicuspids. The patient was in his 75th year.

Fig. 15 represents models of an upper and lower where dentures were inserted March 24, 1910. The upper cuspid and molar were capped and connected by a bar; the lower bicuspids crowned with bars extending distally. Note the lingual occlusion of the cuspid. Fig. 16 shows the case completed.

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*Figs. 14, 15, 16 and 17 from models furnished by Dr. Chas. W. Mills, Chillicothe, Ohio.

Fig. 17 shows work done March 8, 1910, in which the Beauman anchor is used by anchoring to the cuspid roots above and below, connected with a bar as illustrated.

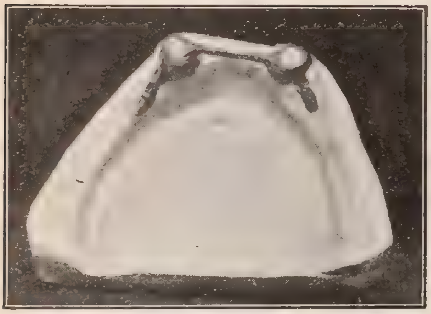
Fig. 18.

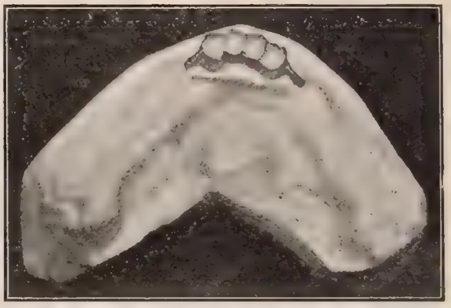
Fig. 19.

Fig. 18 shows a Beauman attachment with additional bars extending distally.

Figs. 19 and 20 represent cases completed March 26, 1908, and March 23, 1909, respectively. In the former the incisors were ground down, caps made and soldered in one piece with bars extending as shown.

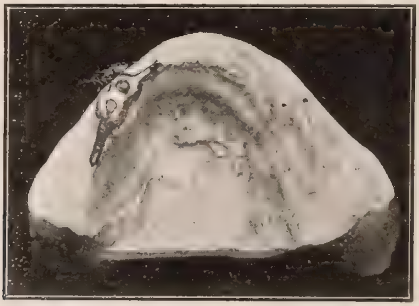
Fig. 20.

In the latter case two bicuspids were prepared in similar manner; the chief interest in this instance being the complete absorption of the process, which is in marked contrast to that portion where the roots remain.

SUCCESS is only for those who are willing to stand by their standards—who are ready to endure the siege of misjudgment—who are prepared to face the fire of criticism and to accept defeat until they become vaccinated against it. Most men who gave up would have arrived if they had kept up.—Kaufman.

A REPORT OF SIX CASES OF COMPOSITE ODONTOMES*

By Thomas L. Gilmer, M. D., Chicago, Ill.

MY excuse, if any is necessary, for reporting these cases at this time is: first, their rarity; second, the fact that they are occasionally mistaken for malignant growths, and consequently large sections of jaws are removed, when, had correct diagnosis been made, no such unnecessary maiming and disfiguration would have resulted; and, third, my desire to add to those previously reported by others six exceptionally interesting specimens of odontomes of the composite variety and to record them where they may be easily accessible to medical men interested in this group of tumors. The first and second of these specimens were reported in the proceedings of the National Dental Association in 1902.

Odontomes are rare in man. They are more frequently found in the jaws of the horse and other animals, but when both those found in man and those found in animals are considered, the number is relatively small. Composite odontomes are most frequently found in the mandible, but are not to be excluded from the maxilla, since two of those in this report were from the upper jaw. They seem to belong to the molar region of the jaws.

Bland-Sutton[1] has given the best classification of odontomes. He has simplified the classification by naming them in accordance with the part of the tooth germ from which they are supposed to originate. In his seventh and last class he places the growths to be described in this report under the head of composite odontomes. His reason for naming them composite odontomes is the fact that they are composed of all of the histologic elements entering into the various tissues composing the teeth, thrown together indiscriminately.

The composite odontome, as indicated, is made up of enamel, dentine and cementum. These tissues may be thrown together in a more or less homogeneous mass, plus well-formed diminutive teeth, all united by cementum, easily made out macroscopically, or the formation may appear to the eye only as a conglomerate mass with no well-marked tooth forms. As will be seen from the illustrations, however, this simple, homogeneous mass, as observed by the unaided eye, is transformed by magnification in a complex tumor of regularly formed teeth with their roots and canals all cemented into a solid and compact body.

The composite odontome differs from the ordinary dentigerous cyst containing diminutive teeth or dentary bodies, in that the dentigerous cyst contains no cement substance other than that which covers the root of the individual tooth, when perfectly formed teeth are found, with each little tooth or denticle separate and distinct from the other; besides there is a well-defined cyst wall and cyst fluid. In the composite odontomes there is no cyst wall or cyst fluid, so far as I have been able to discover.

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*Chairman's address before the Section on Stomatology (A. M. A.), of which THE DENTAL SUMMARY is the representative organ for the dental profession by special arrangement with the Jour. Amer. Med. Asso.

[1] Bland-Sutton: Tumors, Innocent and Malignant.

The origin of composite odontomes has not been fully made out, but it is reasonable to attribute them to the same source as that of multilocular cysts or adamantomas, that is, to unatrophied remains of the epithelial cord; or possibly to extra buds given off from the epithelial lamina, which have become distorted in development. Black attributes supernumerary teeth to additional buds, which buds he has demonstrated.

The diagnosis of odontomes is generally spoken of as difficult. If the growth is of the composite variety and has been uncovered through absorption of bone with suppuration of the soft tissues overlying, it may be and is often mistaken for necrosed bone, since the color and general appearance is very similar, but on close examination, by means of the sharp steel probe, the texture is found different, the odontome being of a denser structure, resisting penetration, while dead bone may be penetrated to a limited degree. In addition to this difference we find in all cases of necrosis of the jaws thickening of the overlying soft tissues with induration. These conditions do not accompany odontomes. It may also, when not exposed, as before indicated, simulate osteoma, likewise that peculiar thickening of bone sometimes found about infected pulpless roots of the molar teeth. It may be confused with sarcoma of the jaw or adamantoma. If the growth can be reached with the sharp steel probe, differentiation from the before-mentioned tumors may generally be made. The surest method of differentiation of odontomes fully covered by bone is by the aid of the skiagraph. The odontome, being of dense structure similar to that of the tooth, may be skiagraphed in the jaw, as are the roots of teeth. The history accompanying odontomes is of value in diagnosis. They are of slow growth, the enlargement of the jaw usually having been noticed months or even years before the case presented to the surgeon. Such slow growths would not be

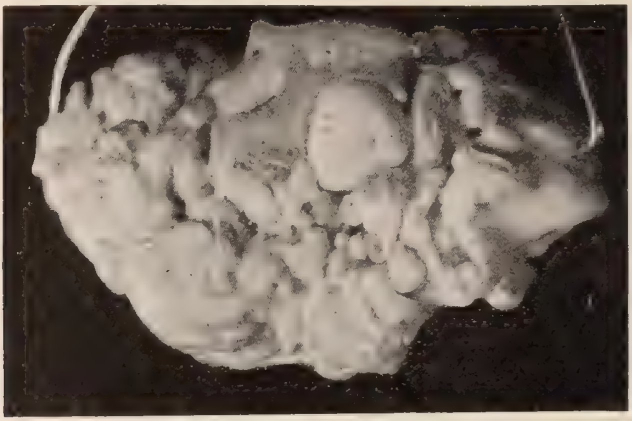

Fig. 1.—Composite odontome.

the case in sarcoma. The absence of pain before the growth reaches the surface also differentiates it from most malignant neoplasms.

CASE 1.—The remarkable growth shown in Figure 1 was removed by me from the right side of the lower jaw of a young man at my clinic at Northwestern University Dental School. Figure 2 shows the reverse side of this odontome. The history of this case, as given by Dr. Charles S. Leininger, of Chicago, who brought the patient to the clinic, is as follows: "Patient, aged 19, came Oct. 7, 1900, for treatment for a supposed alveolar abscess, seemingly caused by a badly decayed right lower second molar. A large quantity of pus was drained off and the roots of the tooth removed two days later. The swelling of the gums disappeared shortly afterwards and the patient had no trouble until six weeks later. The patient showed at this time a condition similar to that when first seen, except for the absence of pus. I cut a considerable portion of the gum from the enlarged jaw and packed in borated gauze, expecting to find a third root, but in this I was disappointed. The opening I made relieved the patient of pain, but the enlargement gradually increased in size and extended buccally and distally. Two weeks after the incision in the gum was made patient returned with an acute inflammation of the part." When I first saw the patient the condition was as above described by Dr. Leininger. On probing with a sharp-pointed explorer I made out a hard, rough body, which gave the characteristic sensation received when tooth tissues are touched by an instrument. The body was too rough and large to indicate a tooth. The appearance of the gum and the discharge of pus, which was now present, indicated necrosis of bone, but the sensation communicated by the explorer clearly contradicted it. I at once concluded that an odontome was present. The first molar was in place, but loose from absorption of its roots, so was

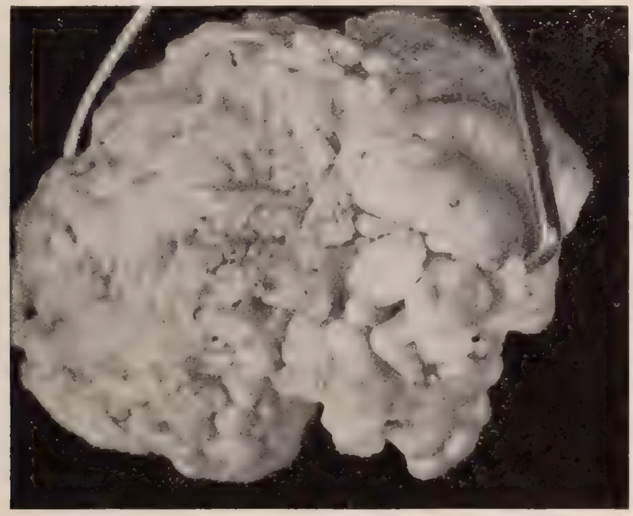

Fig. 2.—Reverse side of odontome shown in Figure. 1.

removed. The second molar had been removed by Dr. Leininger and the third molar was not yet erupted. The jaw was much enlarged buccally and lingually. I made an incision antero-posteriorly and raised flaps of gums on both sides, exposing the jaw and a portion of the growth to view. The overlying process was cut away. I found most of the bone absorbed on the buccal aspect of the jaw and but little left on the lingual surface. With drills and cross-cut fissure burs I cut away the bone on the buccal sides of the growth and also a part of that left on the lingual aspect, when the tumor, with some difficulty, was pried from its bed and removed, after which I found posteriorly at the bottom of the cavity, the third molar, seemingly perfectly developed. This odontome is the most remarkable one I have ever seen. It is composed of diminutive teeth (Fig. 3), more or less perfectly developed, of the incisor, cuspid and bicuspid types, with large numbers of denticles and enamel drops cemented together within this oblong, crescentic mass. This odontome measures antero-posteriorly 34 mm., bucco-lingually 18 mm., and from above downward 19 mm.

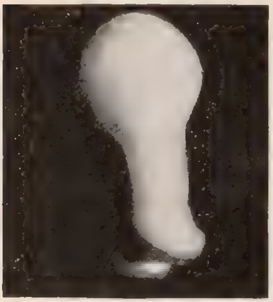

Fig. 3.

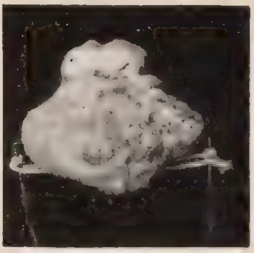

Fig. 5.

Fig. 3.—Diminutive tooth from odontome shown in Fig. 1 magnified.
Fig. 5.—Odontome from lower jaw of woman aged 22.

CASE 2—Figure 4 shows an odontome removed by me from the upper jaw of a patient aged 20. All the teeth were in place except the second molar. The first molar was loose from absorption of the roots, caused by pressure of the odontome. The patient was quite sure that very recently he had had the second molar removed, but I saw no positive indication of this. This is the only one of my three cases in which I lack positive evidence of the presence of the three molars, as well as all of the normal set of teeth on the side of the jaw in which the odontome was found. This case was sent to my clinic by a practitioner for an operation for necrosis, the odontome having been mistaken for a sequestrum of bone, which was not surprising, since the body had the characteristic brown color of necrosed bone, and there was much swelling and a flow of pus. On probing the mass with a sharp steel instrument, I readily discovered that I was not dealing with dead bone, but with tooth tissues, so made diagnosis of an odontome.

The jaw was much expanded buccally and somewhat lingually, causing considerable disfigurement of the face. The loose first molar was removed and the growth removed, but not until much bone was cut from about it. Above and posterior to the growth, in the socket from which it was removed, was found the third molar, perfectly formed. This growth is spherical in form, with an irregular surface, caused by the protuberances. It measures in its greatest diameter 28 mm. and in its least 22 mm. It differs from No. 1 in

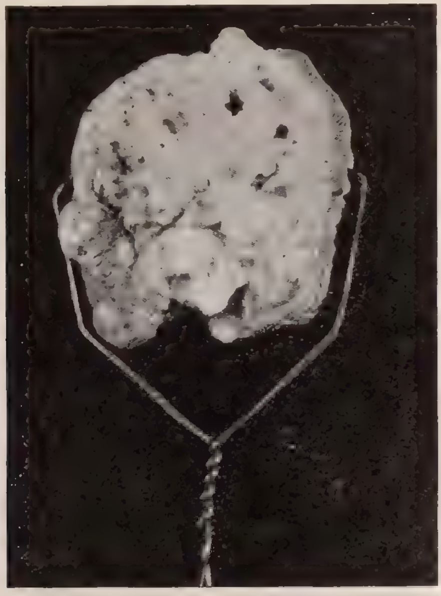

Fig. 4.—Composite odontome which microscopically shows no tooth formation.

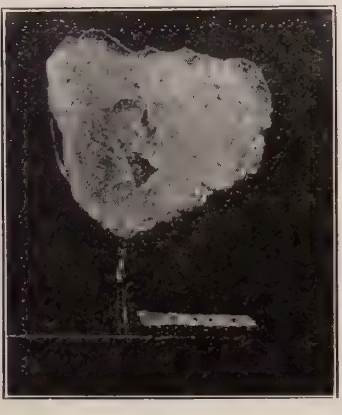

Fig. 6.

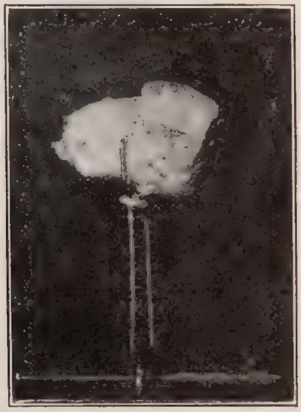

Fig. 7.

Fig. 6.—Odontome with structure similar to those shown in Figures 4 and 5.
Fig. 7.—Odontome of which history is given in Case 5.

that there are no definite tooth forms visible, but enamel, dentin and cement irregularly placed; therefore it belongs to the third class.

Case 3.—Figure 5 shows an odontome from the lower jaw of a young woman aged 22. She consulted me for an enlargement of the left side of the mandible. The bone was much distended bucco-lingually in the region of the first and second molars. These teeth were quite loose and a small amount of pus was discharging at the gingival border of the gums about them. The enlargement had first been noticed two years before she visited me. At no time had there been pain, but for several months past there had been soreness of the teeth and gums overlying the growth. On passing a sharp steel probe in the interproximal space I discovered a hard substance which was rough and too dense to be bone; diagnosis, odontome. I removed the loose teeth and found their roots almost wholly absorbed. I cut the process away and removed the odontome which measured in its greatest diameter (anterior to posterior) 25.2 mm.; above downward 22.4 mm.; labially-buccally 18.4 mm.

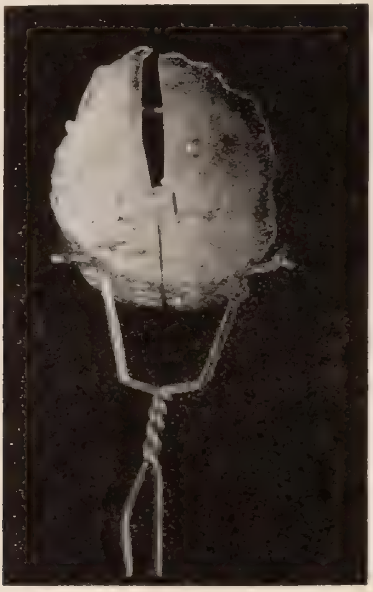

Fig. 8.—Odontome from which sections shown in Figures 9 and 10 were cut.

Case 4.—This odontome (Fig. 6) was removed by Dr. Herbert A. Potts, of Chicago, from the lower jaw of an 18-year-old girl in the clinic of Geheimrat A. Bier, Bonn, Germany. The patient had noticed a swelling and soreness of right side of jaw three years before; this was followed by discharge of pus into the mouth with exposure of a hard, irregular mass in the region of second molar, right side. Pus continued to discharge around this mass. The clinical diagnosis was necrosis of jaw with large sequestrum. Extensive operation from without was proposed. Closer examination by Dr. H. A. Potts revealed small nodules of enamel on the tumor and a corrected diagnosis of odontome was made. A small incision was made within the mouth. This allowed the tumor to be lifted out. Decalcification and microscopic section confirmed the diagnosis of composite odontome. The patient made an uninterrupted recovery.

Case 5.—This odontome (Fig. 7) and history was given to me by Dr. Victor H. Fuqua. "Miss Mary M., aged 19, came under my observation Feb. 14, 1903. Examination disclosed swelling of the left cheek. There was an offensive discharge from the nostril. On examination of the teeth was found what I suppose was the buccal roots of the first molar (the second molar evidently having been lost, or never having erupted). This tooth being very loose, I attempted to extract it, but was unable to do so. Nitrous oxid was then administered, the gum cut away freely, and the flaps laid back, disclosing a dense movable body, which, with difficulty, I removed with the forceps, exposing the floor of the Antrum of Highmore. The

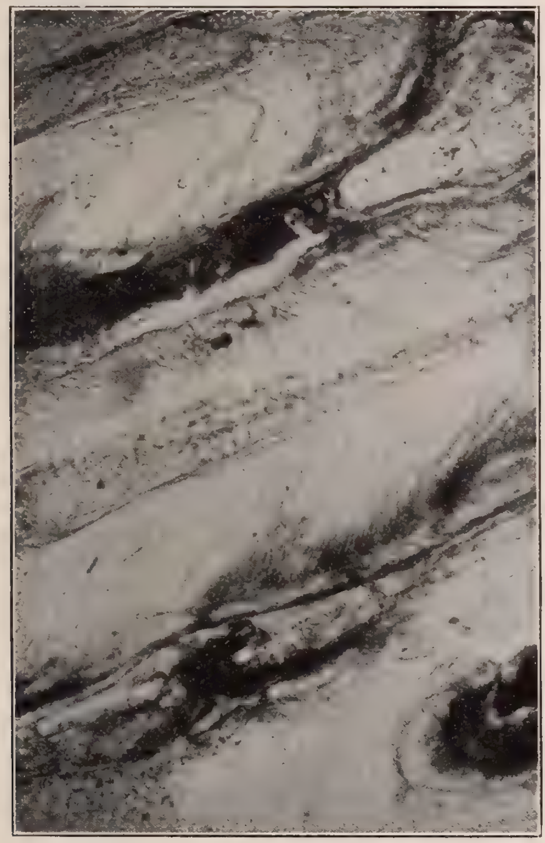

Fig. 9.—Section cut from odontome shown in Figure 8.

antrum was cleansed, irrigated and packed with iodoform gauze. Recovery was rapid and complete. Since the removal of this odontome, the third molar has erupted."

CASE 6. -Figure 8 shows another of the third class. This case was reported by Dr. Black to the Illinois State Dental Society in 1879. It is a somewhat smaller growth, measuring 24 mm. from before backward, 20 mm. from side to side, and 14 mm. from above downward. From sections of the tumor Dr. F. B. Noyes has made photomicrographs, which show most beautifully and perfectly the characteristic composition of this class of odontomes. In the report to the Illinois Society Dr. Black said of the histologic appearance of the sections: "For the purpose of examining its structure I sawed it through, halving it in an antero-postero-perpendicular direction, and cut some sections. I found all the tissues of a normally developed tooth, but in a state of confusion (Figs. 9 and 10). There is an entire absence of any proper pulp cavity. The disposition or arrangement of the tissues is peculiar and striking. It is as though there were a thousand teeth, exceedingly minute, growing as close together as they could be

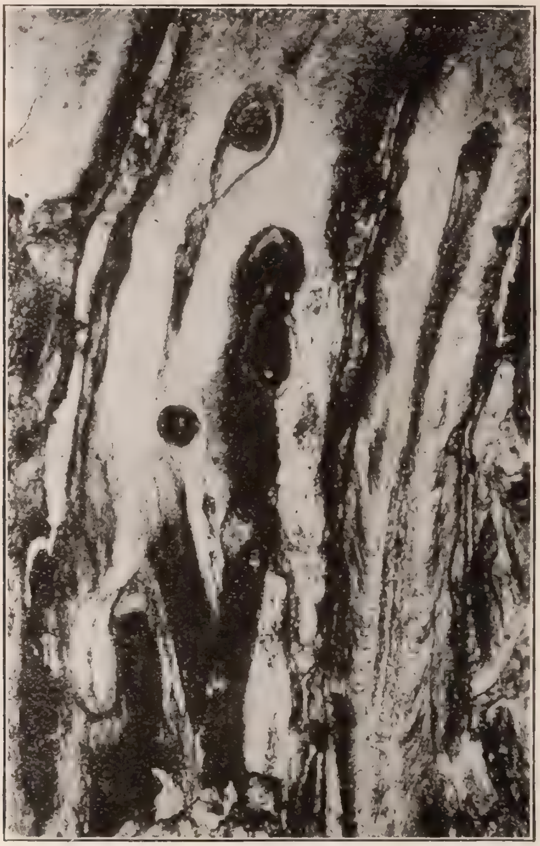

Fig. 10.—Section from odontome shown in Figure 8.

crowded, and the interstices between them filled up with enamel and cement. In the field of the microscope, with the sections I have, we shall often be able to see a number of these diminutive teeth at a single view. Each has its own little pulp chamber in due form, its own separate dentin and its own enamel cap, and plastered in and about and added on to these there is a considerable amount of both enamel and cement of very irregular formation. Many of the pulp chambers are partially filled with calcospherites. These also appear in many parts of the specimen in profusion. It is interesting to note the resemblance of this odontome to the normal structure of the teeth of some of the lower orders of animals, especially some species of fishes, in which there are branching and radiating pulp cavities.''

ABSTRACT OF DISCUSSION.

Dr. M. H. Fletcher, Cincinnati: I have never seen such large odontomas as Dr. Gilmer has shown without attachments. It only indicates what Nature will do when she is stimulated to action. This conglomerate mass is simply an instance of Nature's attempt to produce a new organ, as is shown in any new growth, such as carcinoma, sarcoma and various epitheliomas, which are proliferations, in a sense, of the tissue from which they arise. They grow to a size which becomes pathologic. In the case of the odontoma you do not have the bad results that often occur with malignant growths. At the same time we have evidence of tissue stimulation resulting in dentine, enamel, and cementum many times resulting badly. On the other hand, surgeons often are able to utilize Nature's method of procedure to the end of saving life. I expect to show in a paper at this meeting the reproduction of cement on the root of a tooth to a remarkable degree. Among others I shall show a section of an odontoma that I found twenty-five years ago, which shows what stimulation of any reproductive tissue will do.

Dr. Frederick Noyes, Chicago: I want to say a word about the histologic structure of these tumors and compare the different kinds that have come under my observation. Some are very loosely put together. There are hundreds of teeth that can be seen on the surface with the unaided eye, and a great many of those wash out with the soft tissues attached to the tumor and are lost in the preparation of the specimen. That one little tooth shown was one saved out of the sink in which the washing occurred, and on it the distribution of dentine, cementum and enamel is apparently normal. In other specimens you cannot distinguish a tooth at all, but you can see little globules of enamel on the surface and portions can be recognized as dentine and cementum. But when the section is cut, ground and examined, there are different canals from which the tubules radiate, and the adjoining teeth are fastened together by cementum. The whole structure is made up of individual teeth of one form or another, fastened together by a greater or less amount of cementum. I have never seen a specimen fixed and decalcified to show the cellular elements. I should be much interested to see one. If a piece could be cut out at once, decalcified and cut so as to determine the relation of the soft tissues to the hard it would be very valuable.

Dr. James E. Power, Providence, R. I.: I should like Dr. Gilmer to go into the clinical manifestations. What causes the patient first to seek relief? How much pain is connected with this condition, especially the odontoma that he reported? Was it surrounded by an alveolar process, and how much lymphatic involvement is connected with that condition? Also, especially in the lower jaw, how much loss of function was there, and what are the principal facts which would enable a clinician to make the diagnosis? What would first bring the patient to the specialist's office? There are some tumors that will develop to a large size without giving the patient much pain, and I am trying to find out whether or not the odontoma is in that class, or whether it is a chronic inflammatory process, without marked symptoms.

Dr. Eugene Talbot, Chicago: More than thirty years ago it occurred to me that there must be a law governing these conditions, just as there are other laws governing disease, etc. I have given considerable study during the last thirty years to the etiology of these obscure diseases of the face and jaws, and I have tried to lay out a law governing their pathologic development. Here we have a splendid illustration of two conditions in the development of man which must be taken into consideration, first in the arrest of development or shortening of the jaw in phylogeny from the lower vertebrates such as fish, reptiles, etc. In these animals we have, of course, long jaws with a large number of teeth; sometimes as many as three or four hundred, and as we ascend the scale in evolution the number of teeth grow smaller and smaller. In the toothed birds we have sometimes 170, but as we ascend the scale they diminish in number. On the other hand, the human jaw has grown much smaller, and is still growing smaller. I have found many of these conditions are what might be called arrest in phylogeny, and this arrest takes place at the first uterine period of stress, when the tissues are forming. Arrest takes place owing to some condition of the mother in which the reproductive organs become tired out, and this produces arrest at phylogenetic stages, and so here we see in this epithelial cord these bodies that remain throughout life. We find in the human being, in sheep, and in many other lower animals this large collection of teeth as a result of arrest in phylogeny. There may be two or three hundred, or no more than two or three teeth.

Dr. T. L. Gilmer, Chicago: I was aware that this was not a subject that would call forth much discussion, but think it one that interests most of us. It is well to have as many of these cases reported as possible that we may become more familiar with them.

I will answer by saying that in all of my cases there was inflammation and pain of greater or less degree in the area involved. The soft tissues overlying have not had the appearance of those overlying necrosed bone. They are more like those accompanying chronic alveolar abscess. There is no great thickening, or hardening of the soft parts. One patient came for two reasons—first, cosmetic considerations; the face was distended in the side affected, and second, the teeth whose roots had been absorbed were loose, and there was more or less discomfort, pain and discharge of pus. I have not found lymphatic involvement. No great amount of pus is absorbed, therefore the lymphatics are not appreciably enlarged. As to loss of function, I suppose Dr. Power had reference to loss of function of the jaw. The diseased area is more localized, with much less inflammation than is found accompanying severe, acute alveolar abscesses or with impacted third molars.

In none of my cases was there trismus. Sensation of the teeth or surrounding parts has not been destroyed. I have never seen a case prior to the inflammatory stage. The jaw was enlarged. Mention has been made of the slide showing what I denominated a tumor on the tooth root, in differentiation between it and an odontoma. It seems to me that an odontoma is a tumor made up of tooth substance or small teeth indiscriminately placed, while this specimen is clearly a tumor on the root of the tooth, or we might call it a malformed tooth. It appears to me as though there had been extrusion of a part of the tooth during development.

It may not be strictly true that merit always wins, but that hardly accounts for the wide berth some men seem bent upon giving it. Why not give merit a fair chance, anyhow?

PYORRHOEA (ALVEOLARIS) AND ITS RELATION TO CROWN AND BRIDGE WORK*

By J. P. Carmichael, D. D. S., Milwaukee, Wis.

I HAVE chosen this subject in the belief that no two branches in dental practice are more closely allied than pyorrhoea and crown and bridge work.

As a profession we have long striven to discover a systemic cause of pyorrhoea alveolaris, but today we have permanent cures by simple local operations and treatments. Our journals contain many articles discussing the ills inflicted upon the system by the absorption of micro-organisms of general diseases, which freely mingle with the food during mastication and are distributed throughout the alimentary tract.

Where could we find a more natural culture bed for micro-organisms than beneath the loose gum about the necks of the teeth?

It has been stated that the microbes of fifty per cent. of all germ diseases can be found in cultures obtained from matter taken from beneath the gums affected by this disease.

Dr. Hartzell, one of our most noted specialists, holds that many cases of diabetes are due to the ingestion of pus in pyorrhoea.

The medical profession has long been at a loss to establish the true pathology of diabetes.

Redier, of Paris, holds that in diabetes the saliva contains sugar and undergoes lactic fermentation, in consequence of which both teeth and gums suffer.

Lemoine, of Edinburg, also holds that diabetes involves mouth complications and says gingivitis seems to be due to the rapid multiplication of microbes in the buccal cavity.

Brandt, of Berlin, also holds that diabetes and mouth diseases are closely connected.

I venture to say that old practitioners of dentistry, of experience, can recall that nearly all of their patients known to be suffering with diabetes, were for years afflicted with pyorrhoea. Dentists having to deal with pyorrhoea trouble have years afterwards seen their work and skill in crowning and bridging brought to naught by the ravages of this disease. We should, therefore, make sure of the foundation upon which we are to build.

The first great principle in the treatment of disease, is to remove the cause. Perhaps in no other disease is this truth more exemplified than in the treatment of pyorrhoea. The difficulty in dealing with it has been heretofore due principally to the crude instruments with which we were compelled to operate, as well as a lack of knowledge of the character and cause of the disease.

Briefly, I may define the character of this disease as a disintegration of the gum margin, causing it to part from its union at the neck of the tooth, accompanied in the great majority of cases by inflammation, exudation of pus, and in all cases sinking of the gum. In advanced cases there is loosening of the teeth with destruction of the peridental attachment and final loss of teeth. Contrary to the accepted theory of the present, I hold that the cause should be classed as purely local, due principally to neglect of the teeth. This neglect permits the food to lodge upon and about the necks of the teeth, there to decompose and ferment, and to attack and destroy the delicate membranous union of the gum and peridental membrane, a progressive pathological condition which frequently produces periostitis and alveolar atrophy. Injury to this membranous attachment may be due to many causes, such as calcareous deposits, gold bands, ligatures, regulating appliances and rubber dam clamps. In all cases I believe that I would be able to point out that the primary cause of pyorrhoea is due to local irritation.

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*Read before the Indiana State Dental Society, June, 1910.

This union of the gum at the neck of the tooth once detached, exposes the peridental membrane and periosteum to chemical action entirely foreign to their nature, because the gum is their natural protection. The result is disease and death of those membranes at the exposed area. The tenacity with which this peridental membrane, although dead, adheres to the root cementum, makes this continue to be the seat of microbic action until the edge of the alveolar process is decomposed and completely destroyed. After a wasting of the bony structure, it is perfectly natural that the gum would sink, thus exposing the roots of the teeth; this should not be regarded as destruction of the gums, because although they are inflamed, being well supplied with blood, they regain their normal condition very quickly upon the removal of the diseased tissue from the roots beneath them. In other words, I hold that it is not the gum tissue that is contracted by the disease, but the bony structure that is lost. No doubt, morbid and debilitated physical conditions may have a bearing on pyorrhoea because the resisting power of the system is lessened. I hold that we should look to the primary trouble as local.

Tartar has never been properly regarded by our profession in its relation to pyorrhoea.

Tartar, varying in density and color, but always *following* the destruction of tissue, we find causes an obstruction, which may aggravate the disease. But if we were to take any foreign substance and form a rim about the neck of the tooth, allowing it to remain there several months; when removed the surface beneath would show an infection of the first stage of pyorrhoea.

My travels in the interest of Carmichael's attachment for bridge work brought me in contact with the leading men of our profession throughout the country, and the salvation of my own teeth led me to consult with many specialists in this line for years.

The treatment I received six or eight years ago was beneficial, but what could be regarded as an absolute cure was not accomplished until two years ago. Since which time I have as healthy a mouth in this respect as any one.

I am prepared to put my own teeth in evidence as to the absolute cure of this disease, and I can now show you where the roots, half exposed, are solid, serviceable and healthy.

Dentists often remove tartar, but never mention to their patients that they have pyorrhoea, although in some instances a portion of the root has become exposed. What became of the alveolar process about the root of that tooth and what destroyed it? I will venture to say that there never was a case where there was a deposit of tartar about the necks of the teeth but what you could recognize the first stages of pyorrhoea; the fact that the deposits remain about the gum margin long enough to form tartar, will, in that time, excite enough irritation to cause the beginning of pyorrhoea; the tartar being one of the effects of the disease and not a cause.

I have often examined the mouths of dentists, where they insisted that there was no pyorrhoea, and have found the disease so far advanced that I could scoop pus from some location between the teeth, which proved to them conclusively of the progress this disease was making in their own mouths; this same class of dentists will not call it pyorrhoea, until the teeth begin to loosen and some of them fall out. When they observe this state of things in their patients they exclaim, "Oh, you have pyorrhoea and are going to lose all of your teeth!" I am going to say right here, that unless you can do better than to simply remove the tartar, you might as well leave it alone. I have always believed in the cure of this disease, but no positive achievements were accomplished except by those operators who were so skilled that they succeeded in removing all diseased tissues. The advent of a set of instruments constructed upon the plan of a drawplane was the one achievement that enabled operators to remove the diseased tissues, as well as all calcareous deposits from the root surfaces without undue injury to the soft tissues, leaving all affected areas of the root with a smooth and polished surface.

Dr. Black has said, "that so small an indentation as that made by the sharp point of a pencil would be sufficient to retain ten thousand microbes." Would this not impress you with the importance of leaving this root surface clean and polished in every part?

We have always known that extraction eradicated the disease, proving conclusively that the cause of the disturbance was removed with the tooth; naturally, the problem was to remove this disturbing cause and arrest the progress of the disease; if, then, this disturbing cause is removed with the tooth without leaving any infection, would it not go far toward proving that it is not a constitutional disease? And, furthermore, efforts by some to transmit this disease have absolutely failed. I say to you, gentlemen, when you have removed every particle of diseased tissue without having left a scratch upon the affected tooth, so that microbes may find lodgment therein, but a smooth, shining surface is left, mechanically or otherwise, a cure is effected and the pyorrhoea is at an end.

Instructions in how to properly brush the gums and the general antiseptic baptism of the mouth should be regarded as of the utmost importance to your patients. Much harm is done by the use of powdered pumice and other hard gritty substances for a general scouring of the teeth, often indulged in by dentists and in some instances the patient has been advised to use substances of this kind.

We all know that the natural gloss of enamel, when once destroyed by whatever cause, is very difficult to restore to its original life luster which adds so much to the beautiful appearance of the teeth, giving beauty of expression and animation to the face. If we could keep the human teeth perfectly polished and in the glossed condition so often noticed in canine teeth and which is the natural state, tooth powder would not be necessary, simply the tooth brush to stimulate a healthy vigor to the gums.

As to the question of how far this disease may become advanced before a tooth is beyond salvation, I would say, that some operators consider that at least one-third of the peridental membrane should be intact, or in other words one-third of the root attachment, remaining still good I frequently save teeth in emergency cases, where the attachment in the jaw is *more* than two-thirds destroyed, and have made them of great use in the service of supporting bridge teeth. It is possible, if teeth were properly cared for, to avoid the occurrence of this disease, and when that time comes, when people are properly enlightened regarding the care of their teeth, this disease, which today is the cause of the loss of ten times more teeth than all other dental diseases combined, will scarcely be heard of. Is it not remarkable, when finding a diseased condition of teeth so prevalent, that the impression has gone forth that it is natural upon the advent of age to have the teeth loosen and fall out, whereas they would naturally be more firm in old age?

To eradicate this disease would require education of the child to the proper value and care of the teeth, but it seems peculiar to human nature that when the teeth have been neglected up to middle life no amount of advice does the least bit of good, and the disease is sure to advance to that stage where pain, nature's outcry, forces the negligent to pay attention to the condition of the teeth and gums.

Imagine the great comfort and happiness of old age if the disease known as pyorrhoea were eradicated—what one thing could be imagined more beneficial to the human race than to accomplish this? Well might men like Rockefeller, Carnegie or some other philanthropist with his millions perform in this field the greatest boon mankind has ever known. It being possible to bestow upon the human race this great benefit, why not the ways and means that would develop a working system? Research laboratories have been established for the good of the race in other things, but in this great field nothing has been accomplished save by individual effort alone

Give us the means by which we may secure genius, skill and the scientific combined efforts of the best men in the profession of today and this dread disease will be banished from the mouth of humanity. Realize that this disease, purely of local origin, as I have said, has continued through one generation after another, destroying most all human teeth before the advent of old age, becoming so general in its effects that fifty per cent. of the human race is affected by it. I am often reminded of the old woman who said, "I have only two teeth left, but thank heaven they meet."

Our profession will have attained its zenith when we have educated the youth to take such care as will remove all causes that predispose the teeth to decay, and this same early attention will prevent the occurrence of pyorrhoea. Nearly nine-tenths of the teeth that are lost today are lost because of pyorrhoea, so naturally these cases fall into the hands of the crown and bridge specialists. Crown and bridge work have become so well established in our operations of substituting lost teeth, that we deem it our duty to search out and restore to health teeth which can be made to serve as abutments; therefore, to properly eradicate the diseased condition of teeth remaining, which are sure to be affected, the cure must be accomplished before the attachments are made. Pyorrhoea cannot be cured where there are bands and other obstructions to interfere with the proper treatment. One who has done much in the treatment of pyorrhoea can readily see that all attachments for crown and bridge abutments must be made without obstructive bands or shoulders, that will retain foreign matter, in contact with the gum margin. In my clinic I will endeavor to show the methods I deem proper for this class of operations.

The greatest good I have done for my patients is to restore to a healthful condition a mouth affected by pyorrhoea. To witness the rapid recovery from the swollen purple and bleeding condition of the gums to that of a pink, hard, healthy color is a pleasure and a beautiful sight to the eyes of one who loves his profession.

DISCUSSION.

Dr. W. C. Hessler, Crawfordsville: We are greatly indebted to Dr. Carmichael for the production of such an excellent paper.

It is the rehearsal of the observations, impressions and experiences of a man who has worked long and conscientiously for his patients, and now brings to us—his fellow dentists and co-workers—the results of his labors and observations.

In his introductory remarks are citations from which we could infer that pyorrhea is a cause for diabetes. If this be true, we may have many cases in which sanitation of the mouth should be performed.

It appears that the essayist concludes that pyorrhea alveolaris is entirely a local disease. There are causes for the inflammation and disintegration of the gingival margins other than calcareous deposits and mechanical irritants.

In my opinion, in many instances, pyorrhea alveolaris is a local manifestation of a systemic condition, wherein the excess of insoluble crystals in the animal organism find an avenue for escape through the salivary glands and the mucous membrane of the oral cavity.

Many observers have cited us instances in which the pathological conditions have been lessened, and often entirely controlled by correcting the abnormal functioning of other organs in the body.

I should like to call attention to a paper by Dr. Howard T. Stewart, of Greenville, Miss., which appeared in the March issue of The Dental Summary. Dr. Stewart cites many instances wherein pyorrhea alveolaris was controlled by treating the patient for other diseased conditions which affected the mouth and gums reflexly.

Dr. Carmichael speaks of tartar without distinguishing between salivary calculus and serumal calculus.

Experience has shown me a vast difference in skill required to remove the serumal deposits and the skill necessary to remove salivary calculus.

Dr. Carmichael says, "We have always known that extraction eradicates the disease, proving conclusively that the cause of the disturbance was removed with the tooth." I claim that you have *not* removed the primary cause of the disease. The tooth is only a medium or an accessory for the introduction and installation of the disease.

The tooth, being a hard substance with immobile surfaces, becomes an admirable substance upon which these crystalline substances are deposited.

The surface of the tooth is not constantly being renewed, as is the case with the mucous membrane by the exfoliation of the squamous epithelial cells, and the pushing outward toward the surface by the mucous excretions.

In consequence, the uric acid crystals or the various calcic products are caught up, with some of the dead epithelial cells in the mucin, and glued to the tooth surface.

I am sure that if Dr. Carmichael has ever mounted a bridge between the two lower cuspids, to replace the lower incisors, he has found salivary calculus accumulated upon the lingual surfaces of such bridge teeth. And, no doubt, he has seen tartar accumulated upon the artificial denture made by his neighbor dentists.

I am not sure that we can prove the presence of serumal calculus in the edentulous jaw. Let me ask—Have we removed the primary cause by extracting the teeth?

And now something in regard to mounting crowns and bridges upon diseased teeth.

Dr. C. N. Johnson has always urged upon his students, and dentists in general, to remove all the deposit and put the tooth about to be repaired or filled, in as healthy a condition as possible. This applies to crowning teeth, as well. In a few cases I have first devitalized teeth with arsenical paste, not pressure anesthesia, and mounted crowns with band or ferrule.

These diseased teeth seem to have returned to a normal condition, while other teeth in the same mouth required further treatment to retain them in a healthy state.

There are quite a number of specially devised instruments on the market now, so each dentist may make a selection to suit his own ideas, but *skill* only comes by paying the price in *effort*—and by keeping everlastingly at it.

To the dentist who wishes to keep the mouth and teeth of the patient who has pyorrhea alveolaris in an ideal condition, I would advise frequent sittings for his patient to hold and retain the normal or nearly normal conditions which he may have established. In conclusion I should like to ask these questions:

Can the dentist reduce the amount of insoluble crystalline substances, which are being eliminated by the glands in the oral cavity, with purely local treatment?

Does the treatment and general sanitation of the teeth and oral cavity improve a diabetic condition?

Dr. C. A. Barnhill, Indianapolis: The doctor has given us a good paper. I heartily endorse the greater portion of it, but I can not agree with his statement that pyorrhea is local.

Of course, those persons believing that pyorrhea is local have a convincing and an apparently strong argument when they say that the disease is eradicated when the teeth are extracted. It has been my belief for a long time that pyorrhea is constitutional and comes from the blood. If I am correct, then the removal of the teeth gives a cure only to the extent that there is no place for the lodgment of the calcareous matter.

In my practice I have not noticed that diabetes accompanies pyorrhea. I am glad to know of the association and will give it some attention. I am positive that uric acid plays a part in pyorrhea and is worthy of your consideration.

To my notion the diet plays a very important part in the treatment of pyorrhea. You will find that heavy meat eaters are the ones suffering most from the disease. The human body is taxed to its utmost in caring for its waste, so in eating that food which contains more uric acid than any other it taxes the excretory organs, especially the liver and kidneys beyond their capacity. Scientific investigations have demonstrated that in man the liver destroys only about one half of the uric acid circulating in the blood. To be sure, many indulge in flesh foods with apparent immunity. The liver and kidneys will in time become unable to perform their functions and the waste matter accumulates in the system, causing cancerous conditions, rheumatism, gout and pyorrhea. The teeth are decaying prematurely from want of the necessary mineral elements, which in time seriously interferes with the proper mastication and digestion of food. In treating pyorrhea we all admit that it is necessary to remove the calcareous matter or any foreign irritating substance.

Now then, together with this, to get the best results, instruct the patient to live on a low protein diet, keep the feet warm, the head cool and the bowels open.

Dr. J. P. Carmichael (closing discussion): I am well pleased with the expression of opinions brought out in this general discussion, and it is especially gratifying that I did not meet with any more serious opposition regarding many of the statements made in my paper. I am glad the question was put to Dr. Ottolengui regarding his views, pertaining to uncleanly regulating appliances causing pyorrhea; he admits the retention of foreign matter to be a factor in the beginning of this disease; and while he does not state positively that he believes it to be of local origin, he says that injury to the gum margin may be one of the exciting causes; I believe we shall always find a local cause. My personal experience supports this view.

I recently treated a case where there was an infection of the gum following the extraction of the diseased bi-cuspid root. I clipped off the gum posterior to the cuspid. After healing, the alveolar process on the distal surface of the cuspid tooth remained exposed to some extent. Shortly thereafter, this exposed bone became detached and I removed it, whereby the peridental membrane on this surface of the root was clearly exposed. I made it my business to watch the effects that might be produced by the unnatural influence to which this membrane was exposed, and in the course of a few weeks I found a developed case of pyorrhea in this particular locality, although previously this gum margin was perfectly healthy. This proved to my mind conclusively that if the peridental membrane becomes exposed and infected by micro-organisms, the disease known as pyorrhea will develop. This term applies properly to an advanced stage of the disease, although this name we now use generally from the first signs or stages to the complete destruction of the alveolar process and loss of teeth.

I have seen many cases of the early stages of this disease, on children's teeth, at the age of ten and twelve years, due to infection of the peridental membrane, manifested by green stain about the necks of the teeth. We know this stain to be heavily laden with micro-organisms.

Certain conditions not generally designated as pyorrhea should, nevertheless, be classified under this disease, such as where there is an acute inflammation at the gum margin, from which there is an acid excretion. Often the gums are so inflamed that they are quite painful and extremely annoying. Cavities occur at the necks of the teeth which are difficult to deal with owing to the extreme sensitiveness caused by this highly acid excretion.

Again we find certain cases where there is no excretion from the gums, commonly called dry recession. This term really means nothing; it merely calls your attention to the fact that the gum is sinking and the root becoming more exposed, which, of course, is due to the destruction of the alveolar process. Here again we have the same disease, under different conditions, but no flow of pus; you will find, however, in these cases, quantities of dead peridental membrane, and when this is thoroughly removed and the crown and necks properly polished to the healthy union of the root attachment, you will have absolutely cured the disease.

In the treatment of pyorrhea, the last step is perhaps the most important, namely, to polish and smooth the surface of the entire exposed tooth area to the very border of the healthy tissue even to the bottom of all pyorrhea pockets. By this means we are enabled to restore the enamel to the brilliancy that nature intended. And so long as the polish is high enough, the teeth ward off the foods that would otherwise be retained on the surfaces.

The luster on the teeth, too, is a vital element in the expression of the countenance, and contributes to the attractiveness of the person; particularly, when in animation. No matter what the color or shade of the teeth may be, the mouth is naturally a shadow box, which reflects the ruby color of the lips. The element of personal beauty is well assured by a life luster to the enamel.

We realize that the enamel of the teeth is as hard as porcelain, and can be marred or roughened only by chemical action. When, accordingly, the enamel is corroded or dull in appearance, we have always found trouble to make it really smooth and to restore its luster. Many have been using prepared chalk, or even pumice; but I submit that these substances are too harsh. The result of their use is rather to destroy the luster and to leave the surfaces dull; so that this process defeats our real purpose. If you want to satisfy yourself of this fact, just dry the teeth after you have used these substances on them.

When, however, you bring the teeth up to the high degree of polish to which they are capable, it is practically impossible for any foreign substances to adhere to them; and, accordingly, I have been giving this subject my earnest attention many years. I have now produced a preparation that will polish the teeth without scratching the surface, and will restore the life luster to enamel. You will realize how grateful my patients are when I dismiss them with their teeth polished to a brilliant degree of luster, and they realize at once how much more readily they may keep their teeth looking well.

I have long since disparaged the idea that patients should come to me ''to have their teeth cleaned'' or ''to remove the tartar,'' as they express it; but I have been instructing them in the importance of the thorough treatment of their teeth, that will remove all diseased tissue from beneath the gum margin, and will keep their mouths in a healthful condition. I caution them of the dangers sure to result from further neglect, and I can treat them accordingly.

SURGICAL TREATMENT OF CERTAIN TYPES OF CONGENITAL CLEFT PALATE

By Chalmers J. Lyons, D. D. S. Jackson, Michigan.

Assistant in Oral Surgery in the University of Michigan.

THE subject of cleft palate is one that is looked upon with more or less indifference today by both the medical and dental professions. The lack of interest which these two great professions display in the deformity can possibly be accounted for by the fact that one profession depends upon the other in taking care of these unfortunate people, each thinking this field of medical and dental endeavor is entirely within the province of the other, while as a matter of fact it is a field fully in the province of both. Another reason for this seeming indifference may be that in many cases the remuneration to be had for the successful

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relief of these unfortunates is not sufficiently attractive to justify the time and energy that must necessarily be expended. The writer believes that the highest mission in life for the true professional man, whether he be a physician or dentist should be to do all that he can for the relief of suffering humanity, and surely to those afflicted with the deformity of cleft palate there can be no suffering more intense both mentally and physically than they have to endure throughout a lifetime where no relief is offered.

It has been the observation of those connected with the work that there is no class of people who are more appreciative than those suffering with this deformity. No class of patients which either the physician or dentist comes in contact with will show their sincere and deep appreciation when a cure is effected more keenly than will those suffering with the deformity of cleft palate.

The writer here wishes to acknowledge his indebtedness to Dr. Truman W. Brophy, of Chicago, who taught him the principles of the surgical treatment of cleft palate. To Dr. Brophy the medical and dental professions owe a debt of gratitude for placing the surgical treatment of cleft palate upon a sane and scientific basis whereby relief can be given to these afflicted people incomparable in its grand results to any which the great surgeons or great dentists of the world have ever offered. To Dr. Cyrenus G. Darling, Professor of Oral Surgery in the University of Michigan, the writer also wishes to acknowledge his indebtedness. Through Dr. Darling's long successful experience as a general surgeon he has been able to offer from time to time many practical suggestions in the work in which we have co-labored during the last four years, and without which it would not have been possible to have accomplished the many successful results which have been achieved.

The deformity of cleft palate is too well known to merit an elaborate description of it; suffice to say it has no parallel in the disfigurement of the human body. It is a deformity which if allowed to remain uncorrected marks those afflicted as unfortunate human beings who are doomed to go through life alone, unable to mingle and associate with their fellow men, and to live and die unloved and uncared for except by those of their own flesh and blood.

Unfortunate children who are born blind are provided with institutions in nearly every state, whereby they may be enlightened and educated in the arts and sciences that they may become useful and intelligent citizens. The deaf have their institutions for the training of those who cannot hear; so also are the lame and tubercular provided for by charity and philanthropy.

Children who are born with the terrible deformity of cleft palate, which in the majority of cases has associated with it the deformity of harelip, have few institutions of this kind to which they may go for relief, but the large majority of them must wend their way throughout a life time of mental anguish, a curse to themselves and those who bore them, ever conscious of their deep affliction.

In 1897 the State Legislature of Michigan enacted a law whereby all poor children within the confines of the state born with this deformity might receive free care at the State University Hospital at Ann Arbor. Since that time many children have been presented to that institution for relief and the words of commendation and appreciation from the grateful parents most certainly repay the State of Michigan for its charitable efforts.

The life history of these unfortunate human beings does not vary greatly in its general sameness. Unable to receive nourishment in the normal manner, the physical development of the child with cleft palate is impaired, and as a child's mental development is dependent upon his physical development, such an unfortunate is handicapped all through life both physically and mentally, in fighting life's battles and is ostracized by his fellows and is compelled to go through life unaided, being held aloof by those who might have been his associates had nature not afflicted him with this deformity.

From these deductions we can but infer that this is at least one cause for this deformity being associated in so many cases with people in meagre circumstances.

There are seldom found two persons afflicted exactly the same for the reason that the cleft varies widely in its extent. The fissure may be of any degree from a slight notch in the lip or a bifurcation of the Azygos uvulae to a complete cleft of the lip alveolar process, palate bones and velum palati or a double cleft of the lip, double cleft of the palate with the protruding premaxillary bones and it may extend through the cheek and even into the brain cavity.

The etiology of cleft palate is not germane to this paper, but suffice to say that the origin and cause are to be sought for among the prenatal influences and in the light of our present knowledge the etiology of this deformity still remains largely theoretical. There is usually found in all of these cases the normal amount of palatine tissue although it is not united in the median line, and it is the rare exception that successful surgical repair of this tissue can not be made if taken in time.

May we revere such men as Kingsley, Suerson, Koeliker, Martin and others who have given a foundation on which lines mechanical appliances may be constructed which will at least aid those afflicted with this deformity. To such distinguished men as Sir Willian Ferguson, Mason, Garretson, Brophy, Owen and Brown we owe most of our present knowledge regarding the surgical treatment of cleft palate which has been a very great blessing to this unfortunate class of people.

While the mechanical appliance has done much for humanity there can be no comparison between it, which is always an irritant, and the natural tissue as a covering for the oral cavity.

It is true that a perfectly fitting obturator may be of more service than that of a natural palate resulting from a surgical operation unskilfully performed whereby it is so stiffened and hardened by cicatricial tissue as to be almost immovable.

When we consider the anatomy and function of the soft palate we can then readily see the advantages of a successfully performed operation over any mechanical appliance that might be inserted. In the production of articulate sounds the normal individual is supplied with a soft palate of great mobility suspended from the posterior border of the hard palate. The soft palate serves two important purposes. First, it is needful in the production of many sounds that they should be free from nasal resonance which would result if permitted to escape through the nasal passages. In the production of these sounds it is necessary that the nasal and oral cavities be completely separated, and to accomplish this the posterior wall of the pharynx rises, forming a ridge against which the soft palate occludes, being drawn backward and upward to meet it. Thus the sound is forced to pass exclusively through the mouth and is clear and distinct. Secondly, the soft palate serves as an abutment against which the tongue rises in the formation of such sounds as K and hard G as in girl, give, go, etc. A cleft of the soft palate consequently leaves the patient with no means of shutting off the nasal passage and with an inadequate organ with which to properly produce articulate sounds.

An individual produces articulate sounds with the normal organs by utilizing the normal action of the muscles of the throat, tongue and lips. These muscles in the mouth of one afflicted with cleft palate become atrophied on account of improper use or exercise.

Not only is speech interfered with on account of the atrophied condition of the muscles, but also is hearing, and this is one feature that a successful surgical operation overcomes, where an obturator offers no relief.

The tensor palati muscle has its origin in the scaphoid fossa at the root of the internal pterygoid plate and the cartilaginous portion of the pharyngeal orifice of the Eustachian tube. It is inserted into the transverse ridge on the under surface of the horizontal plate of the palate bone and also the aponerosis of the soft palate. Its action is to render the soft palate tense and to dilate the Eustachian tube. On account of the points of insertion of the muscle being abnormal in the case of cleft palate, its action must necessarily be very greatly interfered with, it becoming more or less atrophied and consequently there is a failure of the pharyngeal opening of the Eustachian tube to dilate normally and defective hearing results. This cannot be aided by any mechanical appliance for the relief of those afflicted with cleft palate, but can be remedied only by successful surgical procedure.

With all of these abnormal organs of the mouth and throat, the individual in the efforts to produce the sound which he indistinctly hears from others, compels the tongue, lips and throat muscles to adopt habits which are totally unlike normal movements. Consequently our plea to the members of the medical and dental profession under whose care these unfortunates fall is to urge the necessity for an early operation, before the habits of speech are formed and in cases involving the osseous tissue, when the maxillary processes are of cartilaginous consistency, that they may be more easily brought into apposition and united. For cases of this kind the best time to operate is within three months after birth when the maxillary processes are soft and the inorganic salts are not deposited densely. If the habits of speech are formed before the operation has been completed, the incorrect habits must first be overcome and a correct action of the organs must be acquired which makes it very difficult for a patient to accomplish, and perfect phonation can only be accomplished by persistent effort for a considerable length of time on the part of the patient.

(*To be continued*)

SOME ADVANTAGES OF EARLY ORTHODONTIC TREATMENT*

By Rodrigues Ottolengui, M. D. S., D. D. S., L. L. D., New York

WITHIN the past ten years a tremendous revolution of sentiment has occurred within the minds of dentists as to the best time for the inauguration of orthodontic interference. Formerly it was common teaching in all colleges, and consequently it was universally believed, that the correction or irregularities of the teeth should best be deferred until the twelfth year, or often even later. This idea, so long prevalent, is even now being eradicated with great difficulty from the minds of the older practitioners, and I might almost say, of the dental profession. The majority of orthodontia specialists have come to recognize the dangers of delay, but even now hundreds of dentists are telling mothers to, ''Wait! Give Nature a Chance.'' These men do not realize that in the majority of instances to ''wait,'' is to give Nature no chance.

The specialist in orthodontia today is expected rigidly to respect and protect the rights of the general practitioner. It is most embarrassing, therefore, to have a mother bring in a child, with some such story like this:

''Doctor, please advise me when I ought to have this work started. My own dentist thinks I ought to begin at once, but my husband's dentist says that it is ridiculous to try to regulate the teeth before they come through the gum, and that if I leave Alice alone the jaws will grow large enough for her teeth without putting her to the trouble and strain of having regulating done, to say nothing about the expense. Of course, my husband agrees with him, so what am I to do?''

What is she to do, gentlemen? Here is a mother, like most mothers, anxious for the welfare of her offspring. Her dentist, some young man, imbued with knowledge of modern theories and modern accomplishments in orthodontic practice, has given her proper advice, which, however, entails expense. The keeper of the purse appeals to his own dentist, an old, experienced and respected practitioner, and from him obtains just the advice for which he is looking. "Wait! Give Nature a chance! Incidentally, save your money."

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*Read before the Indiana State Dental Society, 1910.

It is, therefore, to the dental profession at large, rather than to the orthodontists, that I take the liberty of addressing this paper; this appeal for early interference.

The purposes of the modern orthodontist are somewhat different from those which actuated the old regulators of teeth. Formerly the chief object was to beautify; the anterior teeth more especially were "straightened," mainly to overcome malpositions made conspicuous by the parting of the lips. Today, some of the greatest problems may be accompanied by visible defects so slight that they are unnoticed by the parents, and often overlooked by the dentist. The modern orthodontist does not announce himself, like the manicure, the hair dresser, and the masseuse, as running a beauty parlor. Cosmetic improvement of the physiognomy is often a correlative result of the orthodontist's treatment, but his primary purpose is to correct malocclusion. He endeavors to rearrange the teeth as nearly as possible to conform with the ideal normal occlusion, not for beauty's sake, but in order to restore the possibilities of normal functioning of these important, and I may say, most important organs.

The human body has been likened to a machine; unlike the machine, the human body is self-sustaining, self-repairing and self-building. The important elements utilized in this building up of the body are water, air and food. If either of these be impure, or insufficient, or improperly received into and improperly appropriated by the body, the body suffers. We have discomfort, dis-ease, and finally disease.

Much speculation has been devoted to the relation between adenoids and nasal obstruction generally, and malocclusion. This is no place for a discourse upon adenoids as a factor in causing malocclusion, but let us for a moment discuss it as a factor in depriving the growing child of that share of nutrition which it extracts from the air with which it is so abundantly surrounded and of which it may share equally with the children of the richest.

Perhaps early in babyhood the infant is attacked with rhinitis which is improperly checked. Who thinks to connect this little cold with baby's second set of teeth? "What nonsense! Why, baby hasn't even her first teeth yet!" But this unchecked irritation of the nasal mucous membrane, causing a thickening of the same and organizing a mouth-breathing habit, may really be the very initiation of some worse form of nasal obstruction, and what is equally important, it may engender incorrect habits of breathing. From improper breathing, short gasps instead of deep respirations, we get a lack of development of the chest, which should and would grow through the exercise of deep breathing. Thus if I may use such a phrase. with a contracted method of breathing, the child suffers with a contracted chest, contracted lungs, a contraction of the supply of oxygen, and a consequent impoverishment of the blood. With such a supply of blood can we look for normal development of the body at any part? The orthodontist, concentrating his gaze upon the teeth, inquires about adenoids, learns that the trouble is present and the child a mouth-breather, and then looks wise and exclaims "Ah!"

If such children were stripped to the waist for an examination, something more than malocclusion would be seen. Those mouth-breathers not only suffer from a lack of development of the jaws, but there is conspicuous a lack of development throughout the entire body. Many of the bones are smaller and shorter than normal, and usually such children are undeveloped in regard to the soft tissues also, the bones of the skeleton being easily traced. Occasionally, of course, we find mouth-breathers who may be "plump," to use a pleasant term, but a careful analysis will show that such cases only accentuate the argument, rather than weaken it. This "plumpness" is corpulency; is fat rather than flesh. These children, in spite of this apparent fulness of growth, are really undeveloped both in bone and muscle. They, however, are usually great eaters; one may as well use the proper term and call them gluttons. By taking into the system an excess of food they grow; they grow in spite of improper mastication, due to malocclusion; and in spite of improper oxygenation due to faulty breathing. They grow, but they do not grow properly in bone and muscle; they grow improperly and get fat. They, however, are conspicuously anemic, and have no vital resistance against disease. Indeed, in many cases, the fat children are less vital than the lean.

This, then, is the condition which confronts us. From whatever may be the initiating cause, the child contracts faulty habits of breathing, or one might say gasping for breath from the upper part of the chest, instead of respiring deeply which would tend to expand the diaphragm and the chest and develop the lungs. The child receives an insufficient supply of oxygen and receives it improperly, with the result that there is necessarily a fault in the metabolism.

This predisposes to a lack of development of the bones of the body, among which, of course, are the bones of the jaw. Meanwhile, the second set of teeth are developing and finally must erupt. Due to a lack of growth, however, the jaws have not enlarged to proper arch dimensions, and consequently we have large teeth growing into small jaws. This is another version of the old fable of inheriting large teeth from one parent and small jaws from the other. The inheritance may be from the parents, but it is a heritage of bad habits; bad habits of breathing and bad habits of feeding.

Here, then, is the situation. A child improperly supplied with one of the three elements of life, viz., air, is growing up with a lack of development of its body, which lack of development in the jaws is causing a malocclusion of the teeth. Malocclusion necessarily causes improper mastication, and improper mastication of food places an added strain upon every organ engaged in the process of digestion and assimilation. These organs, through overwork and lack of nourishment, must necessarily lose vitality, and consequently become more and more liable to disease through inability to combat those agencies which produce disease. Thus the individual at the time of examination, say at the age of eight or nine, is already suffering from a deficient supply, both of proper food and proper air. His malocclusion, already evident, is a result of malnutrition, and will in turn contribute to and become a cause of further malnutrition. At this moment the highly respected, but thoughtless old practitioner advises papa to save his money; to wait; to give Nature a chance. Again I say Nature has no chance under such conditions.

But is not this sort of advice similar to the argument of the young farmer raising his first crop of potatoes? His neighbor calls his attention to the potato bugs which are destroying his plants, and he says: "They are only eating the leaves. They can't get at the potatoes, because they are underground." But later when he opens the ground there are no potatoes.

The orthodontist of today must be a mouth physician, not a mouth mechanic. He should observe the physical condition of his patient, measure the damage already done, study the causes which have contributed to the derangement, and then apply his remedy promptly but wisely. He should so plan his campaign that he may obtain as nearly normal occlusion as possible, with the minimum of tax upon the child. At the outset, all obstructions to breathing, whether adenoids or other disease of the nasal tract, should be capably treated by a skilled rhinologist. In addition it would be well if the child could be placed in the care of a competent physical instructor, one who understood the art of teaching the habit of normal or deep breathing. This, with exercise which will tend to develop the chest and lungs, will greatly aid. It is my belief that the time will come when the orthodontists will have the assistance of competent physical instructors and teachers of normal breathing, just as the physicians are often aided by scientific masseurs.

If in conjunction with such body building methods the orthodontist proceeds with his more mechanical operation, not only may normal occlusion be expected, but normal growth and conformation of the jaws as well, and this will mean the attainment of the highest type of beauty possible for the individual, so that in the end the cosmetic, as well as the physical improvement of the patient will result.

We must now consider the advantages of early treatment from a viewpoint closer to the actual work and accomplishments of the orthodontist. It has sometimes been said that normal occlusion will be self-retaining. This I believe, or at least that (with certain exceptions which need not be considered here), very little retention of a mechanical nature will be required. But the normal occlusion to which I here allude, does not mean the mere placing of the morsal surfaces of the teeth into what may seem to be normal apposition and interdigitation. The normal occlusion of which I speak, and of which I say that little mechanical retention will be required, involves not merely the true alignment of the crowns of the teeth, but it must include also the true alignment of the apices of the teeth. If this could be accomplished in all cases; if every tooth could be made to normally occlude with its normal antagonists, and if the roots of all the teeth could be moved to positions where their apices would be as correctly situated as their crowns, then retention need only be maintained long enough for a hardening of the alveolar bone around the teeth which had been moved.

To accomplish this after the period of development, or during adult life, may be so difficult as to be practically impossible. The lack of development in one or both jaws or arches may be so great that the rearrangement of what has been termed the "apical arch," might well be impossible. The rearrangement of the coronal arch into a semblance of normal occlusion may often be accomplished, but the retention of the teeth in their new position becomes almost an unsolvable problem. It is in such cases, if in any, that extraction, and a compromise upon something less than normal occlusion may be excusable. And it is my belief that the fact that formerly the great majority of patients were taken at fourteen or older, accounts for the doctrine of extraction as a legitimate practice in orthodontia, a mode of treatment which has received the sanction of really capable men. For it is true that even as early as the fourteenth year some cases present such difficulties that it might almost be considered hopeless to obtain and to maintain normal occlusion. Yet, just as bad cases can be positively cured if taken early enough.

Having said that the old period of the twelfth or fourteenth year is too late, you may ask with propriety what is the proper age for inaugurating orthodontic interference. I will not set down an age, but rather a period, and that period would be during the time of eruption of the permanent set, and beginning as early as convenient and in the best interests of the child's health. In the majority of instances the ideal time would be just when the incisors are emerging, or have erupted. In special cases interference even prior to the eruption of the sixth-year molars is not only permissible, but may even be essential. But ordinarily the time mentioned may be counted as ideal. At this period we may study out the appropriate size and conformation which the arch should finally have, and by establishing such dimensions we may reasonably hope to see the others of the second set erupt into normal relations, or so nearly normal as to require but slight intervention after they have erupted.

At this time it must be remembered that the bicuspids are held within the embrasure of the roots of the temporary molars, and moreover, that their roots are only partly, if at all developed. By moving these temporary molars buccally, we carry the crowns of the oncoming bicuspids with them, and this not only establishes the true arch alignment of the crowns of these teeth, but likewise of the apices, for the roots develop downward after the crowns have been moved buccally. Can we ask for better retention?

This advantage, the bodily movement of the teeth before their roots are fully developed, and the development of the apices after such movment, is equally attainable in all three conditions classified by Angle.

In Class II (Angle) where we deal with distal occlusion, whilst it may frequently be possible to move the teeth into normal occlusion without really moving the mandible forward, it is manifestly preferable to correct the malposition of the jaw, as well as the malocclusion of the teeth. This means a rearrangement of the relations in the Glenoid articulation. And as the Glenoid fossa is most probably formed over and around the head of the mandible, it is manifest that the earlier the mandible is moved forward the greater will be the probability of maintaining it in its new position, because of the fact that the Glenoid region is yet in a formative stage.

I believe this to be equally applicable to Class III, for while I admit that there are cases where the mandible seems over large, so far as my study has gone, I firmly believe that the great majority of Class III conditions are due to a lack of horizontal development of the middle third of the face. A correction of these cases which aims at a forward movement of the entire upper arch will often not only restore occlusion, but may likewise eventually produce complete facial harmony. But it must be remembered that if these Class III cases, as I believe, really depend upon a lack of development of the upper jaw, both treatment and retention must consider this fact. I have heard men say that they have treated Class III cases, moving the upper arches forward, but that eventually they have drifted back. This I doubt, unless the work has been done too quickly and the retention was too brief. My notion is that these gentlemen, who think their cases have drifted back, have been deluded. I believe that the upper arches may be easily kept where we place them, but this is not sufficient. These upper arches, lacking the mysterious cell power of normal development, are in a state of stasis, while the lower jaw, continuing to develop, again outstrips the upper and becomes apparently prominent, while the operator is led into believing that the upper has drifted back. I believe that retention in these cases must involve a continuance of intermaxillary force sufficient to supply that stimulation to the sluggish bone-building cells of the maxillary bones, which will cause their growth to keep pace with the lower, and this should be continued until the eruption of the upper third molars, at least.

DISCUSSION.

Dr. F. M. Casto, Cleveland, O.: Dr. Ottolengui's paper is very interesting, indeed. He has brought out some exceptionally good points and I am sure the subject is an important one to bring before the profession at this time. The orthodontists have been discussing the question of early treatment several years and the concensus of opinion is unanimous that the earlier abnormalities in the jaws and teeth are treated the better. While the orthodontists have discussed this question, it has never been discussed very thoroughly in the presence of or with the general practitioner. The general practitioners see the children at an early age and they should be informed on the subject of early treatment. They have the opportunity of doing a great and lasting good for their patients by being able to advise them early when treatment for abnormalities is indicated. There are a great many cases, if trouble is recognized sufficiently early, that can be treated in a very simple manner and thereby prevent or abort a general malformation of the dental arches.

There is no real good argument against the early treatment of malocclusions that I know of or have ever heard so far as the teeth and jaws are concerned. It is a simple law of nature that the sooner an abnormality is restored to a condition of normality the better and more certain will the natural growth in the affected parts take place. For illustration: If any of you present would plant a tree in your front yard, and if by some hook or crook the tree should get badly bent over to one side, you wouldn't wait until the tree was fully grown before you straightened it up, would you? No, I think not. You would straighten it as soon as you discovered it was bent. The same law applies to the human body. I was very much interested in what the essayist had to say regarding the untoward effects of nasal obstruction and mouth breathing. I wish to emphasize everything he has said. It is an amazing fact to know that more than two thirds of the children are defective breathers. There is no doubt but that children would be far healthier if taught the methods of proper breathing. If a child can breathe well and does so, and can masticate well and does so, there will be no cause for the parents to worry about its health.

The untoward influences on the growth and development of a child suffering from nasal stenosis and being thereby a confirmed mouth breather are well marked and the condition easily recognized. These children present a most distressing appearance. There is an arrested development of the bones of the face, the nose is usually broad and flat, the muscles of the cheeks are drawn out of a harmonious relation with the facial contours, the upper lip atrophies and the lower lip hypertrophies, the mandibular development is arrested, and there is a receding and dropping chin, the child has a vacant and listless expression and the tongue often protrudes; the physical condition is usually much below par, the child being anemic and poorly nourished, usually has little appetite and has no ambition or disposition to get one; they seldom indulge in out-door sports with other children.

The malocclusion of the teeth is well pronounced, the upper teeth protrude, the arch being narrow and the vault high, while the lower teeth recede. The alignment is usually bad and the individual teeth may assume all sorts of mal-positions. This class of cases should certainly be observed by the general practitioner of dentistry and medicine alike and they should see to it in the cause of humanity that the proper care and treatment is administered.

The orthodontists have proved that such a condition is often aborted entirely by early treatment. Then don't you think it is a sad mistake to advise the parents to wait until all these abnormalities become developed? Do you know that the family dentist is held responsible when he advises the parents to wait and such advice proves to be wrong? It is not unusual to hear parents complain bitterly because they have been advised to wait and it certainly is pathetic when an abnormal condition has developed that is practically impossible to cure. I have such a case in my practice at the present time, except it was the grandmother who advised the parents to wait. She acknowledged it, in fact, boasted of it until I informed her what a dreadful and permanent injury she had done the child. Then, oh! then, she repented. She anxiously besought me to do a lot of impossible things. It was an entirely different story with her, but the irreparable damage had been done. It was too late and the child will be the sufferer. I hope you will all profit by the facts that Dr. Ottolengui has so ably presented to you. I wish to thank and commend him for the selection of such a timely subject and for the manner of its presentation.

QUININE AND UREA HYDROCHLORID: ITS USE AS A LOCAL ANESTHETIC IN DENTAL OPERATIONS.*

By Hermann Prinz, M. D., D. D. S., St Louis, Mo.

THE use of quinine as a local anesthetic is of comparatively recent date. Hoy asserts that he has used it externally upon denuded surfaces as an anesthetic for the past fifteen years a procedure which he learned from Sylvester of Ohio, an old army surgeon. The first authentic report in which quinine and urea compounds were used is found in a paper by Thibault. His observations arose out of personal experiments on himself in the use of quinine hypodermically for the cure of malaria. He employed it in one or two per cent. solutions hypodermically, or in fifteen to twenty per cent. solutions on cotton upon external surfaces. Later he reported upon its use in an operation for inguinal hernia. In August, 1908, Brown reports upon its use in a three per cent. solution applied hypodermically in the removal of the tonsil. Griswohl claims that he used quinine hypodermically as a local anesthetic as early as 1896. In 1908, Wyeth reports on the use of quinine and urea in an article entitled, "A New Local Anesthetic of Great Value." On account of two cases of severe sloughing after deep infiltration Wyeth has abandoned its use and is now trying a different formula, which he will report on later. Green very recently reports four minor surgical operations in which he used quinine and urea hydrochlorid as a local anesthetic with anesthesia more or less complete. He employed it in the form of a one per cent. sterilized solution preserved in 5-ccm. ampules. Hertzler and his co-workers have carried on extensive experimentation with this new local anesthetic in general surgery. "They confirmed Thibault's statements, but found that in hernia operations, healing of the external wound was somewhat delayed on account of the thickening of its edges, which proved to be due to an excessive fibrinous exudate produced by the one per cent. solution. When 0.25 per cent. instead of one per cent. solutions were used, the fibrinous exudate was reduced and healing was not perceptibly delayed. Solutions of the 0.25 per cent. strength produced perfect, though less prompt and lasting, anesthesia. Hertzler, Brewster and Rogers agreed with Thibault that a ten or twenty per cent. solution should be used externally or on mucous membranes, and with Brown that in tonsillectomy a three per cent. solution is best. They have found that it is preferable to dissolve the quinine and urea hydrochlorid in sterile water instead of in salt solution; the former gives a more lasting anesthesia, and the latter has no advantage. They recommend it as being harmless in almost any amount."

Dental literature is extremely meager in reports concerning this new local anesthetic. In the *Western Dental Journal* for 1910, Worthley speaks of this new compound before the Kansas State Dental Society,

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NOTE: The substance of this paper is obtained from our original communication published in the *Dental Cosmos* for January, 1911.

and to him we probably owe its introduction into dentistry. A few additional reports are found in the *Dental Cosmos* (May 1908), and the *Dental Register* (July 1910); both notices are condensed statements of the original articles appearing in the *Journal of the American Medical Association.* Worthley states that he "uses a 7-10 grain tablet (of quinine and urea hydrochlorid) to 30 minims normal salt solution. The anesthesia is about the same as with a one per cent. cocain solution." No mention of this anesthetic has been made in current foreign dental and medical literature, except here and there a few lines of news items in which it is stated that a quinine and urea compound is used as a local anesthetic in the United States.

Quinine and urea hydrochlorid, $C_{20}H_{24}N_2O_2 . HCl + CH_4N_2O . HCl + 5 H_2O$, is a chemical compound of quinine hydrochlorid and urea hydrochlorid, also known as carbaminated quinine bihydrochlorid. At ordinary temperature the salt dissolves in its own weight of water with a marked lowering of temperature; its solution reacts strongly acid. The concentrated solution has a straw-colored appearance. The salt is not hygroscopic and is unalterable in the air. It is also readily soluble in alcohol but only sparingly in chloroform. Solutions of quinine and urea hydrochlorid can be boiled without alteration, but they readily decompose on standing. They are slightly antiseptic and are tolerant to the addition of ordinary doses of adrenalin.

Quinine does not specifically affect the peripheral ends of the motor or sensory nerves. When brought in contact with the human blood the poisonous nature of the quinine completely arrests the amœboid movements of the leucocytes, which assume a darker color, and finally break up into granular debris. Quinine is a protoplasm poison which in due time kills the tissue cell. The prolonged analgesia, which remains for hours, and when enough of the injection has been absorbed, even days, finds an explanation in the coagulation of the protoplasm. Hertzler states that "when infiltration takes place, anesthesia lasts from several days to two weeks or longer." More or less persistent induration follows the injection; it may be traced to an exudate of fibrinous material into the infiltrated tissues, resulting in an edema which may last for weeks. The absorption of the injected quinine solution, even when physiologic salt solution is used as a base, is slow. If the tissues are incised immediately after the injection, the solution escapes into the wound, and the resultant anesthesia is comparatively light. Under such conditions, wound healing is apparently not interfered with, while if the solution be allowed to remain until it is absorbed, wound healing is decidedly retarded. This may be explained upon the basis that quinine and urea hydrochlorid is an acid irritant, producing a more or less severe form of sero-fibrinous inflammation. When applied topically upon the mucous surfaces of the mouth in concentrated solution it seems to have no anesthetic effect; the solution is only very slowly absorbed. Hemorrhage seems to be very little interfered with in the early stages of anesthesia; after complete absorption has taken place there is to be observed a slight check in the flow of the blood.

Urea hydrochlorid, which is added to quinine hydrochlorid in the preparation of this compound, has apparently no physiologic effect on the tissues in the comparatively small doses in which it is employed; its sole purpose is to render the rather sparingly soluble quinine hydrochlorid (about 1 : 34) more soluble. Urethan, antipyrin, and other bodies exercise a similar action on the salt.

Our clinical experimentation with quinine and urea hydrochlorid was solely confined to the extraction of teeth of infirmary patients. A sterile two per cent. solution (in physiologic salt solution) with the addition of adrenalin (one drop to each cubic centimeter) was used. The average time of waiting, counting from the starting of the injection to the extraction, was nine minutes. Exact records were kept, especially in regard to the expression of pain. These expressions, of course, portray only the subjective symptoms as felt by the patient. Of the twenty test cases, 90 per cent. of the patients complained of a ''painful injection'' and 80 per cent. of a ''painful extraction.'' It is impossible to correctly gauge the severity of pain, especially in infirmary patients. In most cases the inhibiting effect of the adrenalin on normal hemorrhage could be observed. Only three patients returned for further observations. There was apparently no interference with wound healing, but a slight soreness remained in the soft tissue in these cases. Direct comparison with a novocain injection under the same identical conditions could be made in only one case. This case (record No. 4) illustrated to a nicety the marked difference between the two anesthetics, and it seems to be well to record it here:

Mrs. X, white, forty-two years of age, sent from the infirmary with instructions to have the two lower canines removed. Both teeth showed about the same pathologic conditions, they were slightly loose, decayed and apparently not serviceable for bridge abutments. Peridental injection was made in both cases, the left canine was injected with quinine and urea hydrochlorid, while the right received a novocain injection. The quinine injection, as well as the final removal of the tooth as compared to the novocain injection and the extraction of the so-treated tooth, was decidedly more painful.

By an unbiased comparison of the action of the two anesthetics (novocain having been used as the routine anesthetic in our clinic for the past two years), the many advantages of novocain over quinine and urea hydrochlorid are distinctly apparent.

RESUME.

(1) Quinine and urea hydrochlorid is not poisonous in the doses in which it is ordinarily employed for local anesthetic purposes.

(2) The solution of quinine and urea hydrochlorid reacts strongly acid, and as a consequence severely damages the tissues in the injected area.

Induration and edema are the usual sequlae. Its injection is more or less painful, and it interferes with the progress of wound healing.

(3) Quinine and urea hydrochlorid is readily soluble in water; its solution can be sterilized by boiling without alteration, but readily decomposes on standing.

(4) Quinine and urea hydrochlorid is tolerant to the addition of ordinary doses of adrenalin without interfering with the vaso-constrictor power of the latter.

(5) Quinine and urea hydrochlorid solution, when applied to mucous surfaces in the mouth, even in concentrated solution (25 per cent.), is only sparingly absorbed, and consequently very little, if any, local anesthesia is produced. Aside from this defect, its most persistent, very bitter, taste makes it undesirable for this purpose.

From the foregoing we conclude that quinine and urea hydrochlorid, when employed as a local anesthetic in dental operations, possesses no advantage, but many disadvantages as compared to novocain. While, *a priori*, its non-poisonous nature indicates safety, this safety is only relative as it refers to larger doses. The small dose of novocain (1-4 to 1-3 grain, 0.015-0.022 gram) necessary for the average dental operation may be considered a safe dose. As much as four grains (0.25 gram) have been frequently employed without manifesting toxic side or after-effects. The many disadvantages of quinine and urea hydrochlorid, when used as a local anesthetic, have been enumerated above.

Washington University Dental School, April, 1911.

ORAL HYGIENE AND ITS RELATION TO GENERAL SYSTEMIC CONDITIONS*

By Dr. C. A. Burbridge, M. D., Kalamazoo, Mich.

DENTISTRY, in its wonderful and marvelous strides toward that much-to-be-sought-for goal of fitness and completeness as a profession, has developed a number of most interesting and vitally important departments, any or all of which are indeed most worthy of our attention. Foremost among them, in the opinion of the writer, is that subject which has been so much discussed both favorably and unfavorably, during the past few years, Oral Hygiene. Much has been said regarding this very important subject both to its credit and its discredit. The subject has come to be an issue in an educational way, both in the profession and out of it. However, it is gratifying to those who are more vitally interested in it to see gradual increasing interest manifested in it and the growing demand for its application and introduction throughout the greater body of the laity.

It would be an impossible task to cover the entire field of oral hygiene in its many diversities its numberless phases, in a paper of this length.

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*Read before the Michigan State Dental Society, 1910.

The writer's one aim in presenting the subject is to awaken and arouse still greater interest in the subject and assist in keeping it continually before the minds of every one present.

Dr. Smith has very aptly called the mouth the "vestibule of human life," for here it is that all the nutrient materials and heat supplies for the great human engine are received and acted upon by that very important element of digestion, the saliva and those still more important factors, the teeth. From the mouth are all these necessities introduced into the general system by way of the stomach and we readily see the effect of unsanitary mouth conditions upon the system generally, and cannot but deem it a most worthy factor to our further research and study. Dentistry, for decades past, has been so thoroughly engrossed with its mechanics and general tooth restorations, as to have quite overlooked the serious consequences of mouth contagion, nor has it recognized the grave systemic disorders emanating from infected conditions of the human teeth. Medical science has never looked further than the tongue as a mouth index to systemic disorders with which they daily come in contact. They have overlooked completely, or perhaps failed to recognize the infection, most virulent and prolific, so abundant in this so-called "vestibule of life."

We may better appreciate these conditions when we consider that in the mouth of the ordinary adult we have some twenty-five or thirty square inches of dentate surface which is constantly subjected to changing conditions. This large expanse of surface becomes infested and infected by numerous and varying bacterial formations, decomposed food material, stagnant, inspissated mucous and septic matter from the saliva, pus exudations from inflamed margins, salivary calculus, nicotin and chemical toxins of decomposition which result from the mixing of secretions, excretions and food remains at the temperature of the mouth; that is to say normal body temperature. This most formidable array of possibilities for infection does not include, I would have you note, that other great source of infection, namely, neglected, diseased and untreated teeth.

Can we see what a wonderful possibility for improved local and systemic conditions lies in oral hygiene when we consider that this astounding condition of filth is found not only in the lower classes but in general mouth conditions, high and low born, fastidious and poor alike?

Quantities of literature have been compiled regarding infected atmospheric conditions in school rooms, churches, street cars, public halls, bed chambers, houses, etc., and much has been done, and creditably, too, to better these conditions and lessen the proliferation of bacterial infection from and through such sources. And yet very limited has been the effort to recognize and eliminate the malignant mouth conditions encountered everywhere, but rather has the oral cavity been left to infect the individual and to pour out its contagion in every exhalation, expectoration and cough.

The normal mouth conditions universally found furnish most admirable culture for bacterial growth and proliferation. Our most beloved and lamented Dr. Miller, before his death, had isolated and grown some thirty odd bacterial forms from the human mouth, both pathogenic and non-pathogenic. The saprophytic bacteria find in the fermenting food debris, dead epithelium, abundant moisture and suitable temperature a most ideal and suitable soil to flourish. Vignal found among some seventeen varieties of mouth bacteria the bacillus subtilis, staphylococcus pyogenes aureus, and albus. Miller isolated the bacillus pneumoniæ and many other pathogenic bacteria from the mouth. Thus we have the progressive decomposition of albuminous substances, which are always, we may say, found in the oral cavity, by the action of saprophytic fungi giving rise to toxic albumins, together with the various kinds of pathogenic bacteria, to be considered as elements going toward general or systemic infection and auto-intoxication.

Knowing as we do the conditions existent in the average human mouth which are conducive to infection, and knowing too that everything that passes into the system for its nourishment and otherwise must encounter and be influenced by these conditions owing to their location, it cannot be otherwise than that an endless chain of contagion revolves in foods and air to blood, thence to the organs and tissues, to be deposited as initial infection or in augmentation of some pathological state already established.

Doctor Jesse Shoup has said that in consumption "the system is constantly placed on the defensive and at no time is it able to change front and assume the offensive." Does it not seem reasonable to infer that so long as the neglected conditions of the oral cavity, which we find in the average tuberculous patient, are allowed to continue, that the patient will neither be able to "change front" or assume the "offensive?" It would seem that a rigid effort to eliminate septic mouth conditions in all patients suspected of tuberculosis tendencies, as well as those well advanced in the condition, would offer marked aid in coping with this most-to-be-dreaded disease. We cannot but believe that many, if not all, of the stomach disorders encountered so frequently are most emphatically aggravated by, if not entirely due to, this septic condition of the mouth and teeth.

Many forms of nervous disorders are directly traceable to this source. Dr. Crane, in a recent paper, draws a close connection between neurasthenia, the great American disease, and improper and neglected mouth conditions. Reports show marked septic mouth conditions accompanying diabetes, malaria, typhoid, rickets, syphilis and anemia.

Cameron, Chittenden, Sir Michael Foster and the great representative of the laity, Fletcher, have proven by carefully planned and ingenious experiments, that the thorough and prolonged mastication and insalivation of food stuffs are invaluable to man. Pyloric cancer, intestinal ulceration, digestive and absorptive disturbances in the glands or cells, are absolutely prevented by such method, but these processes are rendered defective through the unsanitary mouth conditions found, as has been said, almost universally.

Hunter in his work on "Oral Sepsis as a Cause of Disease," says, "The danger lies in diseases of the mouth, to the individual, through bacterial and auto-infectional causes." He also states that pin-carditis, neuritis and septicæmia are all the results of primary oral sepsis. Osler says that defective teeth cause more physical deterioration than alcohol.

Is it any wonder then that oral hygiene may rightfully demand our most undivided attention, and a most rigid and vigorous campaign toward the accomplishment of more sanitary mouth conditions when we become aware of the relation it bears to general systemic conditions? We as professional men have a task to perform. We owe it to mankind; we owe it to ourselves. To be able to recognize and eliminate this unsanitary and infectious condition of the human mouth remains our chiefest duty.

The mouth is subject to a very large variety of adverse and pathological disarrangements, any or all of which may and probably are an aggravation to, if not a cause for, many systemic disturbances. The teeth, as you are well aware, are from the time of their eruption to their possible exfoliation subject to decay. The resultant pathological mouth conditions following lack of proper mechanical tooth restoration, would include all manner of pulp affections, such as pulpitis, hyperemia, acute and chronic septic apical pericementitis, acute necrotic conditions, sarcoma and carcinoma of the jaws. But discussion of these subjects would hardly come within the subject in hand. The gums and mucous lining of the oral cavity may quite properly invite our attention.

These are subject to inflammatory influences as acute and virulent as any other body tissue of like histology. Several of these conditions are easily recognized and may be quickly diagnosed.

Gingivitis is a common condition met with and is many times the precursor of something much more serious and difficult of control. We see it more commonly in children perhaps who have never been taught the proper use of the necessary prophylactic methods for mouth sanitation. The adult mouth is, however, by no means immune to it. Gingivitis is characterized by a marked hyperemic area surrounding certain individual teeth on the entire complement of teeth. Where the condition is confined to a few teeth it is generally due to something other than oral negligence, being traceable to irritating irregular margins of neglected cavities of decay, ill-fitting crowns, overhanging margins of fillings, improper and over use of toothpicks, and over indulgence in irritating medicinal agents or alcoholic beverages. It always presents the initial symptoms of inflammation, namely, pain, heightened color and swelling. Resultant pus is rare in a strictly gingival affection. The hyperemia sometimes reaches an advanced stage where the color is markedly purple and the hemorrhage upon examination is profuse. Avoidance of oral hygiene is almost universally the chief cause of gingivitis, as is conclusively proven by a ready and rapid subsidence of all manifestations following the proper removal of the exciting causes and placing the mouth in a sanitary condition.

Stomatitis is another condition met with in the mouth, more especially perhaps among children than among adults, and yet by no means uncommon in the latter. Burchard describes it as a "catarrhal inflammation of the mouth." It may be localized and when it is so, it is practically a marginal gingivitis. It may be also diffused and yet accompanied by a localized tissue destruction, namely, ulceration. Stomatitis is due to a large variety of causes most potent of which is a lack of mouth sanitation. Abnormal fermentation and bacterial proliferation are other causes. It is an accompaniment of some other more serious mouth diseases and many infections and specific systemic manifestations. Marked results for an elimination of this condition are always accomplished by a thorough mouth sanitation. Alveolar pyorrhea is another condition commonly met with in the mouth and one which, in its more advanced stages, is most difficult to combat. It may be described as a pathological state of the mouth in which some of the teeth through necrosis and absorption of their supporting structures, become loosened and ultimately drop out, or through progressive inflammatory action and pus discharging may require extraction. It is a disease of the retentive structures surrounding the teeth only and not due to "uric acid," faulty metabolism, and "constitutional infection," to all of which causes it has been attributed. This statement is proven conclusively by the immediate cessation of all symptoms following the extraction of the affected tooth or teeth, and the failure of the necrosis and inflammation to ever return to the point of extraction.

The real cause of oral pyorrhea is neglect—neglect of the oral secretions, and neglect in removal of food materials and various mouth products from and around the teeth. Ignorance in the care of the mouth and teeth, together with abnormal size and malposition of teeth, fosters and aggravates the condition.

Doubtless the auto-intoxicating effect of pyorrhea is most important of any mouth lesion. Septic exudates from inflammatory process are perpetually present and the resorption of these toxines is inevitable. They are continually carried along the alimentary tract through the process of deglutition and digestion, to be absorbed into the circulation by any of the various ways presented in the stomach and intestines. It is obvious that it may have a marked influence upon many systemic disorders that have hitherto not been suspected in this connection, for with the continual increase in the amount of septic matter disengaged in proportion as the pyorrhetic inflammation increases, the result cannot but be a slow low grade of pyæmic poisoning which goes on indefinitely.

Unsanitary mouth conditions are to be found universally, and we must strive to cope with these conditions. The surgical manipulative removal of all deleterious substances from all tooth surfaces affords the only practical solution of the problem. An enforced change, radical and frequent, of the environment for the teeth and mouth generally, together with the maintenance of a perfect sanitation for the oral cavity, meets the requirements of the case. Prophylaxis, oral, the surgical and manipulative treatment, contradistinct from therapeutic treatment is our greatest hope, and its self-apparent, beneficial results cannot but be recognized at a glance. It has no peer in modern dentistry and the field for its application is unlimited.

Mouth sanitation is one of the paramount issues of modern education. Its importance in the minds of modern broad-minded people is beginning to assume its merited level, and it is not too much to hope nor expect, with the growing interest manifested in it throughout the world, both old and new, that oral hygiene is destined to be one of the greatest accomplishments of modern dental science. May the good work now well started continue, and may the efforts of those devotees of the cause be crowned with success in establishing universal mouth sanitation and a demand for its perfect regulation.

ABSTRACT OF DISCUSSION.

Dr. N. S. Hoff: There can be no doubt in an intelligent professional man's mind as to the serious menace to human welfare of the conditions enumerated by the essayist; and his conclusions that a tremendous obligation is laid on the dental profession, because it is the only organization that is capable of dealing with this vital matter in a proper and conclusive manner. We all, of course, can and most of us do join him in the wish and hope that the propaganda now sweeping over the country may result not alone in a quickened dental professional conscience and enlightened public, but also in some practical means of handling so important and tremendous an undertaking as the prevention and the spread of these dreadful diseases by our present social customs.

It may be profitable for us as dentists to lend what sympathy and aid in the way of contributory facts we may possess to the great movement which is now so prominently before us and the people of this and all countries. We are already finding ourselves called upon in vain for statistics that will be convincing to thoughtful people, to prove the statement our essayist has made, and which many others are making, and which we all honestly believe to be true.

The Chairman of the National Committee on Oral Hygiene, who has during the past year headed the most enthusiastic and largest attended popular convention ever known on a dental subject, made in my hearing a few days ago, what seemed to me a pitiful appeal for facts that his committee could use to convince the public that there was a proper demand for co-operation of all hygienists in the efforts to correct the serious menace of bad teeth and mouths because of contamination in the ordinary and accustomed social relations. He said his committee had exhausted its personal resources and must have help from the profession.

Now, I have no doubt that the conclusions to which we have jumped, in our haste and eagerness, are true, and will in time be proven, because they bear out our personal observations and to us seem so logical as not to require proof, but we seem to forget until, like the chairman of our national committee, we are bluntly asked to prove that which we think is true and need not be demonstrated. I am not a pessimist in any sense, neither am I ultra conservative, but I have believed from the start that we were not approaching this matter in the best way. It is all very well to build a bonfire to destroy our rubbish and unsterilized clothing and bedding from the pest house, but unless we have the means at hand for keeping our bonfire within proper limits, it may prove our undoing.

Now, what I want to make clear here is that getting out into the market places and beating the "tom-toms" and exciting the populace is a much easier matter than providing a sedative poultice or remedy for the burn we incite. What is the use of keeping up an endless discussion on a topic that does not stimulate us to enter into some well planned scheme for carrying out the plain duty which seems so patent to us all that we are overpowered by it and our conscience becomes seared? We all believe there is a public danger in mingling sick and diseased school children with those who are in good health, and I am proud that the Detroit dentists have taken a most practicable method of demonstrating their faith in the correction of this evil through a public charity clinic, which through the heroic devotion of a few has so attracted the attention of the City Health Board as to carry conviction and gain its co-operation for the immediate future. This is a scientific method of establishing a fact, and the short trial seems to have proven so conclusively in establishing the one fact of a need and a practicable way of meeting it as to have resulted in something tangible being done.

The work is good, very good, so far as it goes and it will, I have no doubt, go on increasingly doing its good work until something worth while has been accomplished; but the great thing needed will not come in this way. As long as our big-hearted Giffen keeps his shoulder to the wheel his car will move on. It is good for us to make this public showing and it will teach the public a grand good lesson and may result in a reflex action on our profession which will shock it out of its present lethargic state and fill it with a spirit of desire and effort to cut away from its present somewhat narrow ideals which are causing us to degenerate into a kind of selfish commercialism.

The essayist makes in a few words the statement that oral prophylaxis and the cure of pyorrhea afford a certain cure for certain plague diseases which are today baffling the skill of our learned medical profession. As an idea this statement has come to a few to have all the force of a demonstrated fact, and a few conscientious dental practitioners are using it for rescuing hopeless and abandoned dental organs from a condemned existence, just as though it were a fact and they were divinely called to so recognize its force. If, as has been said, the oral cavity and its dental organs constitute the most important part of the alimentary canal, and that caries and peridental affections are the two great forces that work together for preventing its function, and that the dental profession is the only proper custodian of this important vital organ, is it not high time we had begun to take a broader view of our responsibilities and become more keenly alive to the nobility of our calling?

Personally I have labored for three or four years in the field of oral prophylaxis and surgical treatments of so-called pyorrhea alveolaris, and have been able to demonstrate to my own satisfaction that there is no excuse for the existence of dental caries or the spread of alveolar pyorrhea to the alarming proportions now existing. I have labored in every way to communicate some of my convictions and enthusiasm in this work to my profession, and feel confident that there is a growing conviction that our profession must turn its attention away from mere tinkering and repair methods to the more valuable curative and preventive lines of effort. I said the conviction *seems to be growing* and so I believe; but I am constantly confronted with the fact that while the conviction is widespread, the practice has hardly gone through the incubation period. I make a practice of asking dentists when I meet them if they are doing any oral prophylaxis, and almost invariably they say, "Oh, yes, but I can't get any adequate fee for it." They will tell me how they treat it with Dr. Head's tartar solvent, or Dr. Smith's scaling instruments, and they have so many things to interfere that they wish they could put in an assistant to do this branch of the work, etc. After some more questioning and an inspection of their instrument cases and therapeutic equipment, I am forced to conclude that they are not seriously undertaking the work at all, and that they much prefer to make cast inlays and crown and bridge work is more fascinating and profitable; and so I become discouraged. I realize that dentists today are all so busy with other work that they are accustomed to do, and which their patients seem to need, that they cannot arrange for a place or time to do this work as they know it should be done. And again most dentists do not know how to do the work properly and there does not seem to be any place where they can go and get adequate instruction. Our colleges are no more alive to the value and necessity of this work than our practitioners, and whilst the condition seems very evident and the outlook somewhat discouraging, there does not seem to be any place to put the blame.

The essayist, it seems to me, has read the symptoms correctly and believes we must keep up the agitation until we get a fuller response from the profession, when something will be done. I am hopeful that the few who are carrying on this grand work may not lose their enthusiasm before the grand rush takes place, which it seems to me is inevitable. It is a great thing to be a dentist today and the younger men coming into the profession now have not only a precious heritage of which to be proud, but they are surely to see the coming of the day which will place their occupation on par with the grandest of all humanitarian callings. Nothing in our career for the past thirty years seems at all comparable with this discovery that it is practicable to eradicate all disease from the dental organs. I trust that it may not be that the public will discover this fact before the profession awakens to its opportunity. If we do not take advantage of our discovery and practically put it to the test we shall deserve to lose the reward which ought to be incentive enough to compel a most cordial alliance with this new ideal.

Dr. C. P. Wood, Detroit: This subject of oral hygiene and its relations to systemic conditions is one that should claim the most sincere attention of every man and woman in the dental profession.

I am overwhelmed with the vastness and vital interest centered in this subject, which broadly considered is synonymous with oral prophylaxis. How fortunate for us it is that Dr. D. D. Smith, with his dogged, persistent, painstaking methods, in forcing upon the profession oral prophylaxis, has paved the way for oral hygiene in the public schools. When we, as a profession, awaken to the importance of oral prophylaxis and practice it intelligently and conscientiously, in our offices on our own patients, we will have put oral hygiene on its proper footing.

Dr. Smith, after affirming that septic teeth and mouth conditions are responsible for tuberculosis, kidney, stomach, and liver troubles, pernicious anemia, small-pox, and many nervous troubles, goes on to say, that "the greatest sanitary reform of the world is to revolutionize the unsanitary conditions of the human mouth".

How many times all of us have side-stepped when confronted by a person with an excessively foul mouth. I prophesy that in the not far distant future, that as a result of this move for hygienic mouth conditions it will be as popular to have a clean, healthy mouth as clean hands and face. At present such it not the case. Just yesterday I examined the mouth of a man of refinement with a well established typical case of pyorrhea. Several teeth were so badly affected that I told him he was swallowing at least a teaspoonful of pus every day.

The findings of many scientific men as to the effects of diseased condition of the oral cavity upon the general health and the resultant cure by righting the conditions in the mouth are well known, and most of us have had similiar experience in our own practice. The writer has rarely treated a case of pyorrhea without the patient experiencing a great improvement in the general health. I believe the majority of curable patients in hospitals would recover far more speedily and comfortably if their mouths were put in a sanitary and healthy condition, which most of them do not have, and I hope that very soon hospitals will recognize the need and employ a dentist for regular service upon their patients.

The absolute neglect of mouth conditions by most physicians is something I cannot understand and if every dentist here would supply his physician friend with a mouth mirror and cavity searcher, and spend a little time in calling his attention to conditions which prevail in most mouths, he would help him to save his patients many sleepless nights, weeks in bed many times, and bring credit and due appreciation to himself from such patients.

The most important and fertile field now, for us dentists to push, is oral hygiene and prophylaxis in the free clinic for poor children in public schools, and in lectures given in school for teachers and scholars, about the jaws and teeth and how to care for them. This work should be given principally in the lower grades, as there the children are more impressible than in higher grades. A little patient of mine said, when sitting for prophylaxis treatment the other day, "I tell you I scrub my teeth a great deal better and every day since my teacher tells us so much about them." My little girl of seven years knows more physiology and oral hygiene than most grown-ups from instruction given in the second and third grades. Here is the time and place to correct irregularities of the teeth, undeveloped jaws, fill cavities and instruct them in the use of the tooth brush and floss. How impossible it is for a child to be at its best in school or at play, with an aching tooth, or to develop properly, physically or mentally, where there is serious lack of development of jaws, high narrow arches, crowded over-lapped teeth, and the usual accompanying abnormal condition of the nasal and pharyngeal passages.

Dr. Evans, of Chicago, in speaking of the examination of 123,000 Chicago school children, said that 17,000 had enlarged glands, 3,000 defective hearing, 6,500 defective nasal breathing, 27,500 enlarged tonsils, 4,000 adenoids; all as a result more or less of defective teeth and undeveloped jaws.

The day of oral hygiene and free dental clinics for public schools is at hand and to stay. When upward of three thousand teachers and those directly interested in schools will attend a meeting in Cleveland to establish free dental clinics and lectures, something will be done worth while and lasting. Every society member there gives $32.00 or six half days' time to maintain the clinic the first year.

The statement that pyorrhea is not influenced by systemic conditions is unqualified. I believe that any condition of the system affecting the proper elimination of effete materials will show itself in the mouth immediately and is sure to complicate local treatment. To a degree we have this to contend with in every case. Notwithstanding this fact, I have not met with a tooth which could not be cured and made useful in the mouth permanently, by removing all necrosed tissue from root and socket and anchoring to some other tooth.

The writings of some very scientific men as to pyorrhea being particularly a constitutional disease has a very bad effect upon the profession, helps to clinch the old idea that a person cannot have pyorrhea unless it was left to him by his parents; they create a recklessness on the part of the profession in dealing with pyorrhea and until a tooth or teeth are almost hopeless with pockets, and very uncomfortable to the patient, they will not recognize that pyorrhea is present, or that anything should be done.

It is high time we quit quibbling about its origin and begin treating the local manifestations, for many men have proven that with local treatment alone any case can be cured.

Dr. W. R. Alvord, Detroit: One thing I would like to offer for discussion is the recognition of conditions as they exist in the oral cavity when we first see it. Oftentimes conditions are there which the average dentist fails to take time to study. We get in various stages, gingivitis, all the way up to pyorrhea. Now we must have a more or less comprehensive idea of dental pathology in order to deal with the systemic conditions resulting. You see a tongue with a grey or brown coating, with a red streak down the middle. Well, I happen to know, from my father being a physician, that that means indigestion below the stomach. That would lead me to suggest patronizing, or discussion with intelligent physicians, who are broad enough to tell you what an index the mouth is.

I believe that stomatitis is not so much an indication of local trouble in the mouth as it is an index to a systemic condition. I would like to emphasize the fact that we as dentists owe it to ourselves to put the doctors, meaning the medical profession, squarely up against our chief thought in not taking proper recognition of oral prophylaxis. What we should encourage our physician to do—I think Dr. Wood touched on that—is to recognize a faulty occlusion, and suggest a call to the dentist.

Dr. R. W. Bunting, Ann Arbor: I would like to say a word in appreciation of this paper. I am greatly interested in the subject and I could not help being impressed as the paper was read, by the way in which the matter was presented and how completely and comprehensively it was treated. The subject is to me a very live and interesting one, and I cannot understand why every dentist is not thoroughly enthused with this work of which we have been talking. Perhaps we see some of the reasons right in our dental schools, for the fact that we have the greatest difficulty in interesting our students in prophylaxis. They will spend a great deal of time in making bridges, crowns and other technical work, but they do not want to clean teeth, nor can you get them to do it willingly. Many of our students, as well as the members of the profession, feel that prophylaxis is a sort of side issue, or something along the same line as perhaps the manicurist or the chiropodist—it is a little beneath them; it does not tax their greatest skill, it is simply a mechanical thing; it seems that any one can clean teeth. But really, if we knew what prophylaxis means, I think every one of us would admit that prophylaxis requires just as much skill as the finest kind of mechanical restorations we can make, and the results of prophylaxis are, I think, considering their preventive value to the general system, in many cases by far more valuable to the patient than any restoration which we may attempt, after the tooth or tissue has been lost.

Dr. Burbridge: I have very little to say in closing the discussion other than to urge one point, and that is a point which has been touched upon by several of the men, regarding the medical profession. I want to urge upon every man in the dental profession a further activity in introducing the subject of oral hygiene and its value, to the medical profession. I have found, in presenting the subject before a number of different medical societies, that the medical men are very much interested, and their interest seems to be growing continually. The medical men seem to be anxious for the work, and they are beginning to realize more and more the value of it in helping diagnosis in their own work. I think that we cannot urge this point of oral hygiene too strongly; it is a subject which embraces an enormous field, a field that is almost unlimited, and it would seem to me that it is the duty of every dentist to keep the subject before him, in fact, foremost at all times, never failing to present the subject whenever it is possible, both to the laity and to other professional men. They are, indeed, in a position to aid us.

DENTAL LAWS*

By Alfonso Irwin, D. D. S., Camden, N. J.

(*Continued from page* 288, *April Summary.*)

STANDARDS REQUIRED IN COLLEGE GRADUATES.

Sixth —New laws must be enacted in order to maintain standards (We must first *raise* our entrance standards if we wish to be on an equality with the standards in *foreign countries*, and then we must invoke the aid of *new* legislation to *maintain them*.) In the leading European countries entrance requirements are:

A State University standard for matriculation, which should be adopted in the United States, or a four years' *approved* high school course. As it is now, almost "any old thing," from common school to high school, will be accepted in *some* dental colleges

CERTIFICATE SYSTEM

The greatest defect of the age in the American system of education, literary and technical, is the Certificate System. Every college should conduct its own examinations of the applicants for matriculation and make sure that they come up to the *required standard.* The superiority of the European system of education over the American consists in the fact that they *maintain standards.* The students must pass the examinations before they can graduate, even if it takes them five, six, seven or eight years to graduate. The result of this system is that the European University graduate is far better grounded in theory than the American. Consequently, our American graduates, after receiving a diploma from an American University, go through a European University to *complete* their education. Is not this an acknowledgment of their high standard? The superiority of the American system of dental education lies in the fact that the graduate is better prepared to do practical work of a limited character. The mushroom growth of the professions into specialties demonstrates this point. The American, in his headlong rush to get into business and make money, seeks to learn how to do one thing well and is astonishing ignorant of that which lies within the boundaries of his own specialty.

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*Read before the Michigan State Dental Society, 1910.

COMPETITION

Another glaring defect of the American system of dental education calling for legislative interference, is the unseemly *competition for numbers.* Every dental school seems imbued with the belief that if they can show they have the largest number of matriculates, it is proof that theirs is the *greatest* dental college on the earth. The result is disastrous. In some schools students are entered regardless of the necessary qualifications for admission. You cannot deny this statement truthfully.

Furthermore, where a famous European University will contain five hundred students, an American University may boast of five thousand matriculates. The result is inevitable, that owing to the excess of numbers the students cannot receive the necessary attention in individual collegiate training which is possible in the university containing only one-tenth of that number. Even if you multiply the number of members in the faculty and the instructors ten times, also the accommodations, the equipments and facilities, which we know is not done, the chances of the student obtaining a thorough education in the smaller university are better than they are in the larger institution.

Finally, new dental laws must be established in order to produce greater uniformity in their requirements. The great divergence in requirements of different states and the inconvenience resulting therefrom are too well known to need repetition. We must get our dental laws more nearly alike as rapidly as possible, keeping pace with progress in science, art and education.

EXCEPTIONS.

In handing out gratuitously "bouquets" to any of our friends engaged in the noble occupation of teaching, we, of course, except instructors in such universities as Michigan, California, Harvard, Iowa, Minnesota, Northwestern, Pennsylvania, Vanderbilt, Valparaiso (Chicago College), and all dental colleges independent or otherwise which actually maintain standards. We cannot find words to adequately express our admiration for the wonderful work which *standard* colleges are doing We have a profound respect for dental colleges which maintain *standards.* Unfortunately, there are more dental colleges which are guilty of the breach rather than the observance of their standards; hence the necessity for referring to certain defects in the American system of dental education. We must have dental laws to maintain educational standards, Courts and Prosecutors to execute the law.

But don't fool yourself. Don't be satisfied with half a truth. We all live in "glass houses." The first stone cast at the dental college smashes a window in the dwelling of the dental examiner. The dental examiner himself is not always what he might be and sometimes men are appointed upon Boards who had better give way to some one better qualified for the work.

Neither delude yourself with the belief that *your* State dental law is perfect and needs no changing, nor hug the *fallacy* to your breast that we as dentists have reached that blissful state of efficiency where nothing more needs be done.

AIM OF THE LAW.

The chief reason why dental laws should be enacted is to bar unworthy, incompetent, undesirable, partially-educated men, misfits, mediocrists, failures, swindlers and criminals from engaging in the practice of dentistry in the state. Therefore, we claim that the subject of Dental Laws merits the attention of the executive, judicial and legislative departments of State, as well as your commonwealth and dental profession. We also claim that the phrasing, construction, provisions, interpretation and constitutionality of dental laws are worthy of the most careful consideration of the best legal talent in your state.

EDUCATIONAL ESTIMATES.

The worth of a dentist as estimated by the public and the qualifications of their graduates as estimated by the dental faculties, as well as the estimate of the recent graduate of himself, are very different. These estimates need revision. They need readjustment. The State dental law should attend to this readjustment through the examiners. The readjustment of estimates accounts for the attitude of the examiners and faculties toward each other. They disagree in spite of the well-known peaceful disposition of the examiners. It reminds us of a story. Mike and Bridget were out walking one fine summer day. Bridget was vigorously chiding Mike for his "scrapping" proclivities. In the course of her remarks she spied a dog and cat lying down side by side enjoying a snooze in the bright sunshine. "Why, look at that dog and cat! Even they are at peace with each other," quoth Bridget. "But Biddy, me dear," replied Mike, "you don't undershtand! We are tied togither by the 'Howly' bond of 'Mathrimony.' You tie that cat and dog togither, and see how long they will be at pace wid each other."

MISFITS.

There are several thousand men in the United States who can write D. D. S. after their names who *have missed their vocations.*

Their numbers are being augmented at the rate of about five hundred each year and the longer many graduates have been out of college the greater has become the shrinkage in their education; yet some one here is ready to say, "I don't see what you want a new dental law for, anyhow;" while these deluded victims of "partial culture" are frittering away time and talent which might be of incalculable use to mankind if guided in the right direction. Industrious farmers, capable conductors, skillful mechanics, thrifty shop keepers, handy artisans, beautiful jewelers, inventive electricians, good physicians and excellent teachers have been spoiled to make poor dentists. Does this not indicate that something is wrong with the American system of dental education and that the commonwealth needs dental laws to protect them from the attentions of such scholastic misfits?

OUR OWN MANUFACTURE.

Whenever we meet with one of these misfits applying for a license. we are reminded of Mr. and Mrs. Newlywed. Mr. and Mrs. Newlywed had been married over a year and they had celebrated the anniversary of their wedding by introducing into the community a "second edition" of themselves which was "just like Papa and the very image of its Mamma." One beautiful June holiday Papa hastily purchased a brand new baby coach, wheeled it home and insisted that the family should take an outing. So baby, ensconced in all its finery, was deposited in the coach and propelled through the street by its happy parents, walking proudly side by side, who received the smiling greetings and congratulations of numerous friends enroute. Some of these greetings became so hilarious and pointed that papa's curiosity was aroused, and his attention was finally directed to the front of the coach where the wind had blown away all the covering. At last he was prompted to make an investigation when he discovered, printed in large black letters on the front of the coach, by some enterprising man hustling for business, "OUR OWN MANUFACTURE;" then below, the name of the firm manufacturing this special line of baby coaches.

We suggest that the college producing these *Misfits* should have printed in large black letters upon the chin-scraping collar of this special line of graduates, "OUR OWN MANUFACTURE," then the name of the college below. For instance, SQUEER'S DENTAL SCHOOL, Sleepy Hollow, Nevada.

Each college has its trade mark stamped upon its graduate, so that the experienced examiner will often recognize the college an applicant for a license comes from by his examination papers.

(*To be continued.*)

ON THE PREPARATION OF MODELS.

READERS of this journal are referred to an article by Dr. F. L. Olds, in the January number, headed: "How to Obtain a Smooth and Dense Surface on Casts." In the March number, page 212, appears an article by our good friend, Dr. A. P. Kilbourne, Stewartstown, Pa., referring to Dr. Olds' article, and giving his method.

On reading Dr. Kilbourne's article, we wrote to Dr. Kilbourne and sent him two models, one prepared by the method outlined by him, and the other, one prepared by the Olds method, asking him to compare them, and give us his opinion for publication. Here is Dr. Kilbourne's reply:

> "I never before have seen a model that could compare with the one prepared by the Olds method. It is excellent in every respect, and by comparison is vastly better than the one prepared by the method that I have been using. I have seen so many plates that I am certain were vulcanized on a model very much inferior to the one prepared by my method, that I felt that I had something that might interest the profession, as I thought that, like myself and others with whom I had conversed on the subject, that the time consumed by the Olds method would be sufficient to discourage a busy dentist without giving it a trial. I find that to fully appreciate this method one must see the perfected model. In future I expect to use the Olds method, when the time allowed is at all sufficient. There are, of course, many cases in the experience of a busy dentist, some of whose patients are from out of town, when it will be impracticable to employ this improved method; and, in such cases, my method is certainly superior to some of the methods in vogue."

We wish to thank Dr. Kilbourne, as well as Dr. Olds, for bringing up this important matter, and to say that we are more than willing to forward samples of the Olds method to any practitioner who cares to ask to see them, free of cost, except postage.

A SUGGESTION ABOUT BASE PLATES

By C. B. Voigt, Lorain, Ohio

When the base plate is returned to the cast and it is found that the palatine portion of the base plate is not in contact with the cast, the operator often attempts a readaptation of this part of the plate by pressing it down, and in so doing draws the impression of the occluding teeth nearer the center of the mouth. When the denture is finished, the articulation of the artificial teeth with the natural is quite different from their arrangement on the articulator. No matter how much time you may spend in taking bites or articulating the teeth, there always follows a slight change in the articulation.

The confirmed nagger and the chronic kicker never know they are such. They consider themselves kindly advisors and beneficial critics, unappreciated and misunderstood.

EDITORIAL

THE OHIO PUBLIC DENTAL LIBRARY

IT IS a pleasure to note the establishment of dental libraries here and there throughout the United States. This is a most worthy undertaking and will be productive of great benefit to those having access to the books. In this connection it may be interesting and perhaps helpful to others to tell our readers about the Ohio Dental Library, its origin and progress to date.

In January, 1905, the dentists of Columbus, Ohio, organized the Ohio Dental Library Association for the purpose of gathering the published current literature and all extant publications on dental subjects. An incentive to the organization thus formed was a proposition from the trustees of the Columbus Public Library to set aside a room for a dental and medical library in the new library building then under construction.

This building, centrally located in a three-acre tract of ground, is constructed of white marble and cost $300,000.00. It is fireproof throughout and represents the best in modern, practical library construction. The dental section is housed in a large sunny room with steel stacks installed by the library authorities for the accommodation of the Dental Library. This room is also arranged for meetings of the Dental and Medical societies, seating about one hundred persons. In the building there is also a larger auditorium with a seating capacity of four hundred. This room contains stereopticon, screen, etc., and is available when desired.

The entire care of books devolves upon the public library staff and the librarian, Mr. J. J. Pugh, has arranged, in addition to the general accession record, a separate record in which is entered each book received by the Dental Section, giving history, source and description of each volume and proper credit to the donor in each instance.

This record of the Dental Section is made a part of the permanent city record, as the general library is supported by the municipality.

This splendid arrangement and the opportunity to further the interests of the dental profession, contained in the proposal of the library trustees, appealed so strongly to the dentists of the state that at the meeting of the Ohio State Dental Society in December, 1906, a hearty approval was given the project and the society pledged its co-operation in establishing and maintaining a state dental library. This was further emphasized by an appropriation of $300.00 from the funds of the State Society, and another appropriation of $200.00 in 1907. These sums added to the nucleus of $500.00 previously contributed by the Columbus dentists, and an annual appropriation of $50 provided for in the by-laws of the Columbus Dental Society, have already enabled the Ohio Dental Library Association to secure by purchase, donation and exchange, a library which is believed to be the most complete Public Dental Library in the world.

Being property and part of the public library it is governed by the same general rules with such modifications as suggested by the Executive Committee of the Dental Library Association to the end that the dental profession throughout the state and the public generally may receive the greatest benefit.

Forty dental publications are regularly received and are bound as the volumes are completed. The dental library contains, to date, more than twelve hundred bound volumes, including several hundred volumes of journals and transactions, as well as many incomplete files of American and foreign publications, which it is hoped can be completed through the medium of exchange with other libraries, and otherwise, and along this line the Association invites correspondence.

The Library Association has already effected exchanges, which have been of mutual benefit, with other libraries and individuals in various sections of the country and it has added materially to the general movement in establishing dental libraries.

The library committee appointed at the last meeting of the Ohio State Dental Society intends to do all it can to establish dental libraries in the component societies throughout the state, and the library association will give all the assistance possible.

With a dental library of such promise centrally located in the state and for the use of all dentists, the members of the profession in Ohio should take pride in contributing books or journals that they can spare. All can be used to advantage and the donor will receive due credit for any contribution he may make. All correspondence should be addressed to the secretary, Dr. E. C. Mills, 16 So. Third St., Columbus, O.

Many of the oldest and rarest books on dentistry have been purchased, or donated, and others will be added as rapidly as possible. Few dentists throughout the state realize what a store house of knowledge is contained in the Ohio Dental Library and all are invited to visit it, and use it, whenever opportunity offers.

The Library Association has under consideration and will adopt the Dewey Decimal System of indexing as applied to dental literature, which has been endorsed by the Institute of Dental Pedagogics.

Don't answer a man who comes to you with a heart question with a quotation. Open up a little and let him see that you have a heart as well as he.

MISCELLANY

A PERMANENT DEFENSIVE ORGANIZATION IS NECESSARY TO ASCERTAIN AND SAFEGUARD THE COMMON RIGHTS OF THE DENTAL PROFESSION

THE Dental Protective Association was formed and collected funds for the purpose of testing the validity of dental patents, but has recently so changed its bylaws and strayed from its original purpose as to become the ally and collecting agency of a patentee whose test suit against the profession has been prolonged over the last three years; the patentee in the meantime securing two new patents to strengthen the claims of the original.

It was the patentee's own choice to apply the rigor of the law rather than an amicable and business-like proposition to the profession. A defense committee was therefore organized and its work so successfully performed that there is every reason to believe the original Taggart patent will soon be decided in favor of the profession. But Dr. Taggart's attorney has recently announced the probable institution of suits against many dentists under the claims of the new patents whose validity each individual sued would have to bear the expense of testing in the courts unless we create a dependable permanent defensive organization.

The object of such organization should be safeguarded by proper limitations on the policy and powers of its managing officers. For instance, there should be no such concentration of authority as Dr. Crouse exercises in the voting of all proxies not otherwise assigned whereby he was enabled to change the policy and the law of the Dental Protective Association without the knowledge of the membership or an opportunity for their enforcing a protest. Neither should there be such authority to any three men as is granted to the board of directors of the Dental Protective Association whereby the board can change the law and policy of the organization on a week's notice to itself. Neither should any three men have such extraordinary power as was exercised by the board of directors of the Dental Protective Association whereby there was adopted an agreement previously arranged between Dr. Crouse and Dr. Taggart, providing that *"no member of the Association is to defend or join in or contribute to the defense of any suit upon any of said patents while practicing the method under such permission from Dr. Taggart."*

By this partnership agreement the Dental Protective Association acquires 40 per cent. and Dr. Taggart 60 per cent. of the money collected through this agency. Many consider this alliance more dangerous to the independence and safety of the profession than was the patent situation which threatened to enslave the profession but a few years ago. To say the least, it would be unwise, unsafe, inexcusable and insanely foolish for us to rest in idle indifference while organized effort, backed by capital, seeks to tie the hands of one after another of us until the profession loses its virility, its independence, and its community of interest.

We as a profession have had the benefit of the course pursued for three years by the defense committee in the Taggart-Boynton suit, and a permanent defensive organization may utilize the information, the experience and the data accumulated, and this defense committee, of which Dr. M. F. Finley, of Washington, D. C., is chairman, and its contributing supporters, will be utilized as a nucleus of value in every respect. It seems to us the part of wisdom and sane self-protection to organize, and that ordinary prudence demands and the vast interests of the profession require the most prompt canvassing and quick response possible.

The undersigned therefore invite every reader of this to join in a thorough canvass of the whole profession and enlist as members of a new permanent organization every one whose personal interest and loyalty to the profession keeps alive his sense of justice and fraternity.

In this crisis let not the stigma of injustice or of disloyalty rest upon any member of the profession:

(Signed)

M. F. Finley,
R. Summa,
W. E. Boardman,
Wm. Donnally,
W. H. Trueman,
Wm. Carr,
V. E. Turner,
R. H. Volland,
E. P. Dameron,
H. L. Wheeler,
F. W. Stiff,
E. E. Haverstick,
F. A. Roe,
F. T. Breene,
I. A. Bass,
W. G. Crandall,
A. J. Cottrell,
C. W. Rogers,
C. S. Butler,
H. C. Pelton,
S. H. Voyles,
Geo. H. Wilson,
H. L. Roberts.

Response should be addressed to Dr. M. F. Finley, 1926 "Eye" St., Washington, D. C.

The "Common People" are divided into three classes: Those who "didn't know it was loaded;" those who rock the boat, and those who believe that the foreigner pays the tariff.—Silent Partner.

ARMY DENTAL LEGISLATION.

Dr. L. P. Bethel,
Editor Dental Summary.

Sir:—For the general information of the dental profession and those young gentlemen who have been deterred from seeking service in the United States Army, Dental Corps, by reason of what has been in many respects an undesirable status, I have the honor to state that on March 3rd, a measure entitled "A bill to improve the status and efficiency of the dental surgeons in the United States Army," was passed by the Congress and approved by the President of the United States. (H. R. 23097, incorporated in H. R. 31327 with slight changes.)

It has long been recognized by the Surgeon General of the Army and the War Department, that the Dental Corps is a valuable addition to the Medical Department of the Army and that the status of the Dental Surgeons as authorized by the provisions of the previous law, were inadequate and insufficient to properly reward them for their services or to further tempt young practitioners of the highest professional ability to enter the service.

The passage of the measure referred to has greatly improved the status, pay and allowances of the Corps and should make the service desirable and attractive to such young and unmarried dental practitioners, who think they would enjoy a military life.

Section 2 of the bill provides, "That all original appointments (those made since the above date) to the Dental Corps shall be *acting dental surgeons,* who shall have the same official status, pay and allowances as the contract dental surgeons now authorized by law."

Section 3 of the measure provides that "Acting Dental Surgeons who have served three years in a manner satisfactory to the Secretary of War shall be eligible for appointments as *dental surgeons,* and after passing in a satisfactory manner an examination, which may be prescribed by the Secretary of War, may be commissioned with the rank of first lieutenant in the Dental Corps, to fill the vacancies existing therein."

Section 4 provides further, "That the pay and allowances of dental surgeons shall be those of first lieutenants, including the right to retirement on account of age or disability, as in the case of other officers; *Provided,* That the time served as dental surgeons, as acting dental surgeons, or contract dental surgeons, shall be reckoned in computing the increased service pay of such as are commissioned under this Act." This clause provides for advancement or promotion, practically of one grade, with commissioned rank in the regular service of first lieutenant, with an increase of pay from ($1,800) one thousand eight hundred dollars to ($2,000) two thousand dollars per year. Quarters when available or in lieu thereof when no quarters are furnished, commutation at the rate of ($36.00) thirty-six dollars per month. Longevity pay—which is ten per cent. increase on regular pay every five years, for twenty years. Foreign service pay—which is ten per cent. increase on full pay for services in the Philippines or Alaska—and retirement on three-fourths pay for age or disability contracted in the service and in line of duty.

Section 5 provides, "That the appointees as *acting dental surgeons*, must be citizens of the United States, between twenty-one and twenty-seven years of age, graduates of standard dental colleges, of good moral character and good professional education, and they shall be required to pass the usual physical examination required for appointment in the Medical Corps, and a professional examination which shall include tests of skill in practical dentistry and of proficiency in the usual subjects of a standard dental college course."

Examinations are now being conducted with the view of filling the Corps to its maximum strength. Dentists, therefore, desiring to take the examinations should make application at once to The Adjutant General, U. S. Army, War Department, Washington, D. C., when a blank application sheet will be forwarded to them to be executed and returned.

The character of the physical examination is the same as that required for surgeons entering the Medical Corps.

The professional examination comprehends all subjects taught in standard dental colleges in both theory and practice, and are made as thorough as is fair to the applicant and consistent with the best interests of the service.

The Army Dental Surgeon, if he is to fill his position with credit to himself and his profession, and with proper efficiency to the service, must be well educated, above the ordinary in technical ability and well qualified in all departments of dentistry. The need of these requirements will be more readily appreciated when the statement is made, that the Dental Surgeons of the Army are very rarely associated at a post with a member of their own profession. Consequently, they are thrown entirely upon their own professional resources and must exercise their own judgment in the treatment of their more difficult and serious cases, as consultations are practically out of the question.

Furthermore the surgeon of the post frequently refers cases, involving diseases of the mouth and jaws with which he is more or less unfamiliar, to the dental surgeon, and expects to find, as he has a right to, that the dental surgeon is not only capable of rendering a correct diagnosis, but competent to take charge of the case if required to do so; as in the treatment of fractures of the jaws, deep-seated abscesses of the jaws associated with impacted teeth, facial neuralgia, empyemia of the maxillary sinus, etc., etc.

The Deans of the Dental Colleges and the profession generally can greatly assist the Department in building up and improving the efficiency of the Dental Corps, by advising and recommending young practitioners of the best attainments, to apply for these positions.

The position of a Dental Surgeon in the United States Army is an honorable one and should prove attractive to young men, as the pay and allowances now offered are good, and in the unfortunate event of broken health incident to the service or upon reaching the age limit of sixty-four years, he retires from the service with three-fourths pay, which after twenty years or more of service would give him a yearly income of ($2,160) two thousand one hundred and sixty dollars. Very respectfully,

Geo. H. Torney,

Surgeon General, U. S. Army.

NEW LAW FOR NEW JERSEY AUTHORIZING APPROPRIATIONS FOR DENTAL TREATMENT OF INDIGENT PERSONS

An act to amend an act entitled "An act to authorize cities of the State to make annual appropriations to incorporated dental associations of this State conducting and maintaining dental clinics in such cities for the free treatment of indigent persons," approved April ninth, one thousand nine hundred and ten.

Be it enacted by the Senate and General Assembly of the State of New Jersey:

1. Section one of an act of the Legislature of this State, entitled "An act to authorize cities of this State to make annual appropriations to incorporated dental associations of this State conducting and maintaining dental clinics in such cities for the free treatment of indigent persons," approved April ninth, one thousand nine hundred and ten, be amended so that the said section shall read as follows:

1. Whenever any dental association regularly incorporated under the laws of this State shall maintain and conduct in any city of this State a dental clinic or clinics where indigent persons residents of such city may receive treatment and relief without charge or fee therefor, it shall be lawful for the board or body having control of the finances of such city to appropriate and pay to such association each year, such sum or sums, not exceeding in all the sum of five thousand dollars, as it shall deem advisable, to be used and applied by such association only for the support, maintenance and equipment in such city of a dental clinic or clinics, for the free treatment of indigent persons, residents of such city, and for no other purpose whatsoever.

2. This act shall take effect immediately.

Introduced Feb., 1911, and just passed and signed by the Governor.

NEW PUBLICATIONS

PRINCIPLES AND PRACTICE OF CROWN AND BRIDGEWORK.

By Hart J. Goslee, B. S., D. D. S., Chicago.

Third edition, 1,141 illustrations, 600 pages. Published by the Consolidated Dental Mfg. Co., N. Y.

A comparison of this with the first edition of this work of 292 pages, published in 1903, indicates the actual state of this specialty of dental science, and to the practitioner who would keep pace with the rapid strides of the present decade, the appearance of this edition is most welcome. The qualifications and experience of the author as a teacher and practitioner have enabled him to write with authority on the subject and give a masterly presentation of the many methods, devices and suggestions bearing on the construction of crowns and their assembling with dummies in bridgework.

In the thirty chapters making up the volume, the author gives a brief historical review of the subject, describes the properties of the materials, and then, step by step, describes the technic from the construction of a crown to the latest and most finished specimen that marks the creative genius of an expert.

Methods considered obsolete by some, have merited recognition, because by a mastery of the technic in their construction, greater skill is acquired and an adeptness for mastering the achievements which are stimulating the rate of progress in the present development.

The author has given, in concise form, details of construction and other instructions for laboratory work if found elsewhere would be scattered through many volumes of journal literature. Impracticable methods are eliminated and those considered whose practical features have proven them valuable. The fundamental principles are fully considered, indications and contraindications, advantages and disadvantages pointed out in suiting methods to requirements of cases considered. Suggestions to meet those adverse conditions, such as fractured roots, repairs, etc., are not omitted, and attention is called to many details, which, through neglect, have caused many of our failures.

The author is to be congratulated on the present edition and commended for the manner in which he has credited to their respective originators many of the methods recommended; the publishers upon the excellence of the illustrations and the typographical work of the book throughout.

It is a timely addition to our literature and a valuable work for the student and practitioner. E. C. M.

THE BUSINESS PROBLEMS OF A PROFESSION.

By Frederick Crosby Brush, D. D. S., New York. Published by the Press of the Dental Digest, 1911.

There are probably few dentists in America who have not heard or read some of Dr. Brush's articles on the business side of dentistry, for he has given so many during the past year or two.

This little book of 88 pages is the outgrowth of these numerous articles, and the information it contains is of great value to every dentist. The business problems are concisely presented and comprise the things every dentist should understand to be a successful practitioner.

The author says that he aims merely to present a general plan which may be a guide for those about to begin the practice of dentistry, one that is also adaptable to an established practice and which is being used successfully.

It is a book that every dentist can study with profit.

THE MECHANICAL SIDE OF ANATOMICAL ARTICULATION.

By George Wood Clapp, D. D. S., New York. Published by the Press of The Dental Digest, 1910.

Dr. Clapp, after much experimenting and work, has developed the science of the anatomical construction of dentures and his ideas on the subject are presented in this book.

It is a splendid working guide for the dentist who tries to construct dentures for the best service and artistic appearance.

HUMAN PEARLS.

By Francis Eaton Burnett, D. D. S., Chicago, Ill. Published by the author.

A beautifully bound little volume on the mouth and teeth, suitable for the reception room table. The author treats the subject as follows: The Mouth in Youth; Fable of the Two Little Froggies; Structure and Phenomena of the Mouth; Decay of the Teeth and Disease of the Gums; Temperament as Portrayed by the Teeth; First Teeth—Parental Influence; Growth Versus Decay; Personal Relation of Patient and Dentist.

The book is well written and worthy a place in every dentist's library.

CROWNS AND BRIDGES

By W. B. Tym, Charleston, Ill.

Obtaining wax model for casting gold cope where root is badly broken down.

A plaster model was used for demonstration. First the root is ground off, establishing definite margins, a post of 13 gauge gold clasp metal wire is cut to the length desired and serrated for convenience in retaining wax to proper place, later these serrations aid the cement in holding the post in the root. The wax is then heated and placed in position on the post which is then placed in crown and the wax trimmed to about the shape desired, the crown having previously been ground to articulate. A band is then made to approximately conform to the end of the root, being considerably longer than the circumference of the root. The band, which is of platinoid rolled to thirty-six gauge and is very rigid, is measured to the crown instead of the root and is nicked on opposite sides at the approximate measurement of the crown. These nicks are then slipped together and the extending ends bent down, thus forming the band which is then cut away at the contact points. The crown mounted upon the post, the band is placed in position, having previously oiled the band and all parts coming in contact with the wax, the whole is then forced home and the patient allowed to close and establish the correct articulation.

The whole mass is removed at once or in parts, as is found convenient, the band being easily removed by slipping the ends apart. The surface wax is then removed and the result is usually satisfactory in the first attempt, though a repetition may sometimes be necessary.—*Dental Review.*

SOCIETY·ANNOUNCEMENTS

Indiana State Dental Association.

The program for the fifty-third annual meeting of the Indiana State Dental Association, which meets May 16-18, is completed and Dr. Kennedy, chairman of the Executive Committee, says: "This meeting will be the brightest and snappiest ever held in the history of the Association."

Dr. F. M. Bozer, Supervisor of Clinics, has arranged for a fine clinic. Many prominent men from Iowa, Illinois, Kentucky and Ohio will be on the program and give clinics. We will have an increased number of exhibits, as more space has already been sold than ever before. The meeting last year was good, this one will be better. Otto U. King, Secretary, Huntington, Ind.

Indiana State Board of Dental Examiners.

The next meeting of the Indiana State Board of Dental Examiners will be held in the State House at Indianapolis, beginning at 9 o'clock Monday, June 12th, 1911. All applicants for examination and registration in this state will be examined at this meeting. There will be no other meeting until January, 1912. No temporary permits are issued by this Board. For further information inquire of the secretary, F. R. Henshaw, 508 Pythian Bldg., Indianapolis, Ind.

Lake Erie Dental Association.

The 48th annual meeting of the Lake Erie Dental Association will be held at the Vanadium (Rida) Hotel, Cambridge Springs, Pa., May 16, 17 and 18, 1911. A cordial invitation to attend is extended to all reputable practitioners. J. F. Biddle, D. D. S., President, 517 Arch St. N. S., Pittsburgh, Pa.; C. A. Brennan, D. D. S., Vice President Sharon, Pa.; V. H. McAlpin, D. D. S., Secretary, Warren, Pa.; D. C. Dunn, D. D. S., Treasurer. Meadville, Pa.

Ohio State Dental Board.

The regular spring meeting of the Ohio State Dental Board will be held in Columbus on June 20-23 inclusive. Persons desiring to secure licenses should address the secretary for an application. Applications must be returned to the secretary with the fee of twenty-five ($25.00) dollars. not later than June 10th, 1911. For further information, address the secretary, L. L. Yonker, Bowling Green, O.

Change of Meeting of the Alabama Dental Association.

In order that the dates of meeting of the Southern Branch of the National and Alabama Dental Associations may not fall so near together, the Alabama Dental Association will hold its next Annual Session in Montgomery, Alabama, commencing the first Tuesday in June instead of the second Tuesday in May, 1911. All ethical dentists are invited to attend. E. W. Patton, Secretary.

Change of Date—Kentucky State Association.

The dates of the coming annual meeting of the Kentucky State Dental Association have been changed from May 25, 26 27, 1911, to May 23, 24, 25, 1911. You will please make note of the change in your journal and oblige the officers and members of the Kentucky State Dental Association. W. M. Randall, Secretary.

Oregon State Dental Association.

The Oregon State Dental Association will meet June 5, 6, 7, 8, inclusive, during the annual Rose Festival, held yearly in Portland. F. H. Walgamitt, Sec'-treas.

New Jersey State Dental Society.

The forty-first annual meeting of the New Jersey State Dental Society will convene at Asbury Park, N. J., July 19th, 20th and 21st, 1911. C. A. Meeker, Secretary.

Colorado State Dental Society.

The Colorado State Dental Society will meet in Boulder, Colorado, June 29, 30 and July 1. Chas. A. Monroe, Secy.

Pennsylvania State Dental Society.

The forty-third annual meeting of the Pennsylvania State Dental Society will be held at Hotel Casey, June 27. 28, 29, 1911, Scranton, Pa. Luther M. Weaver, Recording Secretary.

Illnois State Dental Society.

The forty-seventh annual meeting of the Illinois State Dental Society will be held at Peoria, May 9, 10, 11, 12, 1911. J. P. Luthringer, Arrangements Committee, Peoria. J. F. F. Waltz, Secretary, Decatur.

Alumni Association of University of Pittsburg School of Dentistry.

The Alumni Association of the School of Dentistry of the University of Pittsburgh, will hold its annual meeting, Friday, June 9th, 1911. Dr. Arthur D. Black, of Chicago, will be present and a large number of interesting clinics will be given. F. C. Friesell, Secretary, 6120 Center Avenue, Pittsburgh, Pa.

NEWS and OPINIONS

RESULTS

Under this head we shall print from time to time reports of the establishment of dental inspection in public schools, free dental clinics and other news from the field of dental education as the work goes on. We shall thank our readers if they will keep us fully advised of all developments in their locality.

GOOD NEWS FROM NEW YORK.

Editor Kirk and Others Recognize and Emphasize the Importance of the Educational Movement.

New York City, April 7.—At the regular meeting of the New York Institute of Stomatology, on Wednesday night, Dr. Sebert E. Davenport, president of the society, opened the proceedings by saying: ''Oral hygiene is a subject which is just now attracting the attention of dentists, doctors, educators, and settlement workers all over the civilized world.''

Dr. Howe was the second speaker. He said: ''A great deal has been done to arouse interest in oral hygiene. The toothbrush and its adjuncts have been on duty for seventy years, yet the work of repair can often hardly keep pace with the work of destruction.''

There are 3,051 registered dentists in Greater New York. ''There are over 60,000 children in the New York city public schools. Over 80 per cent. of these children need dental treatment. Because dental suffering does not usually result in death, and because the exact results of poor teeth are hard to prove directly to the average person, the subject of good teeth has not been taken so seriously as other subjects whose results are not so far-reaching, and where the number of sufferers is much less.

The next speaker, Dr. Kirk, was welcomed as an editor and a teacher. Dr. Kirk said: ''I have watched the great wave of interest in oral hygiene sweep over the country. The world is sitting up and taking notice of the dentist and his work, and asking us what we can do.''

Dr. Kirk treated briefly the changing methods employed in dentistry. He said: ''All theories unite in proving that we have always tried to treat teeth by mechanical means. We should also study the dental problem as one of nutrition. We should naturally look to the dental college for guidance in this problem. The main reasons that we have not done so are that the chief business of all dental colleges seems to be, not that most important one of solving dental problems, but the problem of lesser importance, the preparation of dental practitioners. Their time seems to be wholly taken up with the undergraduate men. If a man has the scientific trend of mind necessary for research work, he is usually so poor that he is obliged to devote his time to his practice. Let us hope that some wealthy patron will soon endow a college for dental research work.''

Dr. John Huber was the next speaker. He said: ''My respect for my brother dentist is very profound, but I never realized how great it ought to be until my visit to the dental exhibition. The teeth are the sentinels of the body.

''It is a rare thing for a child to present a perfect set of teeth. After examination, a card is made out and the parent is advised to take the child to some reputable dentist. The State Department of Health is encouraging these measures, but it is a new undertaking, which is meeting with many and great difficulties.''

Dr. Potter of Boston said: ''I am going to try to persuade the Harvard School of Dentistry to take up this much-needed dental research work.

''The savage mouth is the only clean mouth. The soft foods of civilization are responsible for much decay of the teeth. We should eat a sufficient quantity of hard food to cause our teeth to be subjected to the same amount of friction the savage's teeth are subjected to.

''It is a scientific necessity that we should chew hard foods. The mental processes of civilization have a great deal to do with upsetting the oral cavity. We can progress along scientific lines by cultivating mental equilibrium.

"We cannot properly teach oral hygiene without bettering the welfare of the entire body. We cannot improve a part without improving the whole."

Dr. P. B. McCullen of Philadelphia spoke as follows:

"I am not quite sure that the dental profession is going to be able to make good with the public. We have 90 per cent. of the molars of all children in this locality with cavities. Attention should be directed in childhood to the special care of the molars."

Dr. Wheeler, chairman of the executive committee, said:

"I believe in infection of the teeth from the intestinal tract. Oral hygiene should go hand in hand with the crusade for nutrition."

Dr. Thaddeus P. Hyde said: "Over twelve years ago I advocated oral hygiene and the education of the public along these lines. The movement of today for oral hygiene is radically different from old ideas of oral hygiene. We should educate the public as to the importance of a clean mouth as an important factor in the education of the whole body."

FT. WAYNE EXAMINATION.

From our good friend, Dr. S. B. Hartman, Fort Wayne, Ind., we have a report of the examination of the pupils of Jefferson school in that city, showing that of the 404 children examined only three had normal teeth, but 234 ever used a tooth brush, and the need of both dental care and instruction is manifest. Following is the report as submitted by Dr. Hartman, chairman of the committee on education and oral hygiene:

To the Fort Wayne Dental Educational and Oral Hygiene Society:

Gentlemen—I respectfully report the dental examinations of the scholars of the Jefferson school of this city as follows:

Scholars having dental examinations	404
First permanent molar teeth decayed	274
Permanent teeth other than first molars decayed	198
Temporary teeth decayed	696
Teeth out of position	364
Teeth that have been filled	179
Scholars needing teeth cleaned	87
Scholars who use tooth brushes	231
Scholars having teeth in perfect condition, not having had dental work, or any needed, in regular grades	3
Kindergarten scholar with teeth in perfect condition	1
Scholars with teeth in very good condition	84
Scholars with teeth in very bad condition	39
Children in kindergarten with teeth in excellent condition	7
Dental examinations for children in kindergarten	22

REMARKS

The teeth of the scholars of the 8A grade had the best general average for teeth in good condition. In this grade special attention has been given to the care of the teeth in the way of the use of the tooth brush, and the care of the dentist.

The number of first permanent molars showing decay is large; this is no doubt from parents mistaking them for temporary teeth, as they appear at the age of about six, and no temporary teeth are removed for space, the teeth erupting back of the last temporary tooth.

Respectfully,
S. B. HARTMAN.

The Free Dental Clinic, under the auspices of the Louisiana State College of Dental Surgery, is attracting the attention of the public and its recognition as a charity is manifested by the large number of deserving people who are treated practically gratuitously by the distinguished dentists identified with the institution, for it is expected that patients will pay for the material used, but if they can not afford to do this they are treated just the same.

Dr. Emile S. Magner, D. D. S., a capable and expert dental surgeon, a native Orleanian, who is well known and highly esteemed, is in charge of the clinic, which occupies three separate rooms with facilities to treat twenty patients at one time. Dr. Magner is not only the executive of the clinic but is chief clinician and demonstrator. He is assisted by Drs. Bolian and Lester, in addition to the seniors who are assigned to such duties as they are conversant with. Under the same supervision the juniors and freshmen are given practical demonstrations in extractions, fillings, bridge and plate work, and practical laboratory work.

Dr. Magner also occupies the important chair of dental anatomy and pathology, and consequently his services in the clinic are most advantageous to the classes.

If the members of the various and sundry women's clubs of the country could be induced to get behind the world-wide movement for education along the lines of oral and dental hygiene, they would accomplish more for the civil, moral and physical welfare of the coming race in a year than all the suffrage agitation has done up to date, or is likely to accomplish in the coming hundred years. You might add to this all that the mistaken, even if highly commendable, eugenic movement can accomplish in another hundred, and still have plenty of room. Of course, this movement for the direct and immediate improvement of the condition of thousands of children is eminently practical; there is little or no place for essaying or speechifying in it, but plenty of room for good, hard, beneficent work.

Fifteen months ago Magistrate Peter T. Barlow established a free dental clinic at 229 E. 121st. St., New York City, which has won the hearty endorsement of the health authorities. During the first twelve months nearly 15000 cases were treated, taking the entire time of two licensed dentists between the hours of 1 and 5 every week day. The daily calls averaged nearly 35. Magistrate Barlow is sending out a personal appeal to friends for financial aid, in order that the beneficent work of the clinic may be extended. This is a splendid showing, and every dentist who has a dollar to spare ought to know without being told exactly what to do with it.

The free dental clinic maintained at Portland, Oregon, in the interests of school children whose parents are financially unable to defray bills has proved so beneficial that the committee in charge suggests that at least one dentist be employed constantly, whose duty it shall be to look after treatments. It is also recommended that stereopticon lectures on the care of the teeth be added to the work of the clinic.

The clinic has been open 18 Saturdays. The reports of work to date show 206 patients, 385 fillings, 27 cleanings of teeth, 115 extractions and 30 treatments. Dentists to the number of 117, members of the Portland Dental Association, have donated their services.

The New York *Times* of April 4 suggests a law making proper care of the teeth compulsory and the provision, at public cost, of ample facilities for doing so. While this might produce the desired result so far as the teeth are concerned, its effect as a contravention of the spirit of individualism underlying our institutions, is open to suspicion, to say the least. Compulsory sanitation, oral or otherwise, is not likely to result as hoped, any more than compulsory prohibition or compulsory sumptuary laws of any kind. Better depend upon individual initiative yet awhile, based upon sound education along the lines of oral and dental hygiene.

Working entirely without compensation and without assistance from the city, 107 San Francisco dentists are conducting the free clinic for school children, keeping it open every morning during the week. The city did appoint a dental inspector at a salary of $100 per month, but all that he has done thus far is to draw his salary. If this amount could be diverted to the actual use of the clinic, it could be kept open all day, with a competent operator in charge. In view of these facts, the finance committee of the board of supervisors has been asked to make a reasonable appropriation for the work.

Elmira, N. Y., is rapidly waking up to the necessity of free clinics for the schools. It is now proposed that each pupil be required to present a dental certificate just as they now are required to present their vaccination certificates. Surely the need is much greater. Infection from small-pox is rare; infection from decayed teeth is so common as to escape notice. More lives are lost every year through oral infection than small-pox has taken in a hundred years.

Since the opening of the educational campaign in Toronto by Dr. Dowd, notice of which appeared in these pages at the time, and the adoption of dental inspection in the schools, the number of children taken to dental offices for treatment has just about doubled. The greater percentage of this increase is, of course, among the middle and poorer classes. That the effect of this increased attention is sure to be amazingly salutary goes without saying.

Here's a quotation from Dr. N. S. Hoff that should be pasted in the hat of every dentist who is lacking in that high degree of respect for his profession to which it is entitled: "Most people who have saved one person's life would claim a Carnegie medal. I believe that the conscientious dentists of Chicago save more lives every year than all the life saving stations on the Great Lakes do in ten years."

The dentists of Trenton, N. J., are rejoicing over the passage by the legislature, March 30, of the bill authorizing the expenditure of $5,000 for the maintenance of a free dental clinic in that city. The original appropriation was but $1,000, which is manifestly inadequate for the purpose.

Dr. James Biddle, secretary of the Pennsylvania Odontological Society, in a report to the Allegheny board of school controllers, declares that 89 per cent. of the children in the public schools of Pittsburg have defective teeth, and require dental care. As this estimate is about at par with reports from other parts of the country, examination will very likely confirm it.

Reports from Portland, Me., indicate that the tooth brush is almost unknown among the children of the public schools; very few of them ever having been taught that any care of the teeth is necessary, while the vast majority are suffering from the usual defects. Dentists are delivering lectures to pupils, parents and teachers, and the educational campaign is well under way.

The dental society of Erie, Pa., has taken up the work of establishing a free dental clinic in connection with the public schools. At a meeting of the Woman's Club the movement was most heartily endorsed and a substantial sum donated to aid in purchasing the necessary equipment.

From far off Phoenix, Arizona, comes the news that the educational wave is washing the foot of the Rocky Mountains. The local dental society has presented to the school authorities a definite proposition looking to the inauguration of dental examinations in the schools.

The dentists of Joliet, Ill., are supplying the newspapers with educational matter along the lines of oral hygiene. The *Herald* of that city pronounces the move a purely altruistic one, entailing, if successful, a lessening need for dental services.

Members of the National Capital Dental Society have agreed to devote their services free of charge for the correction of dental defects found by the school examiners in the mouths of children of the very poor. The good effects of this work upon the rising generation is hard to estimate.

Rochester dentists report the realization of $1350 as the result of an operetta given for the benefit of the free dental clinic and dispensary in that city. The work is to be expanded in scope, including the establishment of branch dispensaries.

The Tacoma, Wash., free clinic was opened to the public on April 1, with eight patients, averaging five cavities each. The clinic is open each Saturday, the work being done by the local dentists, who attend in alphabetical order.

A bill was passed by the Iowa legislature April 3, permitting dentists to write prescriptions, give medicines and perform operations in the treatment of diseases connected with the care of the teeth. What will some of the M. D.'s do now?

The committee on oral hygiene of the Reading, Pa., society reported at the last meeting, April 7, a marked improvement in the teeth, and, consequently, of the health, of the school children, as the result of the work of the free dispensary.

The opening of a free dental clinic in the municipal hospital, Seattle, Wash., marked the birth of the New Year. Already its beneficent work has been far reaching, and the citizens of the sound city are amply satisfied with the experiment.

Minnesota dentists are not asleep. Many of them are delivering public lectures, circulating printing, and in other ways spreading the glad tidings of oral health and cleanliness.

A free dental clinic was opened at New Bedford, Mass., March 28. A small fee is to be charged those who are able to pay.

The Miami Valley Dental Society, Dayton, Ohio, is maintaining a free clinic in connection with the Flower and Fruit Mission in the Gem City.

The town school committee of Middletown, Conn., has voted unanimously in favor of dental inspection.

Burlington, Iowa, is soon to have free dental clinic for school children.

Washington, March 28. — American dentists who are contemplating practicing in France will find the laws more difficult than hitherto, according to consular reports. The American dentist has long reigned supreme in his profession in France. As a result, the high-class French dentists deem a post graduate course in an American university quite essential. There are at present a large number of American dentists in France, yet there is great demand for more.

WHAT IS DOING IN THE SOCIETIES

SOUTHERN BRANCH MEETING

The Atlanta Convention a Conspicuous Success—New Officers of the Southern National.

The thirteenth annual convention of the Southern Branch of the National Dental Association was held at Atlanta, Ga., April 4, 5 and 6, with an attendance of about 350. The meeting was one of the most enthusiastic and successful ever held. More time was devoted to dental education than at any previous session, and the results are sure to be far-reaching. A more complete report will appear in a later number.

The new officers elected are as follows: S. W. Foster, of Atlanta, president; W. H. Scherer, of Houston, Tex., first vice-president; R. Boyd Bogle, of Nashville, second vice-president; C. M. Barnwell, Jr., of Atlanta, third vice-president; W. A. Dean, of Tampa, Fla., recording secretary, and T. T. Moore, Jr., of Columbia, S. C., corresponding secretary.

The executive committee is as follows: Charles L. Alexander, of Charlotte, N. C.; A. J. Cottrell, of Knoxville, Tenn.; H. C. Hassell, of Tuscaloosa, Ala.

The usual manner of selecting officers by ballot was dispensed with and all officers were chosen by acclamation. The place of holding the next convention was not decided upon, the matter being left until after the annual convention of the national association.

The convention was brought to a close with a banquet in honor of Dr. Frank Holland, of Atlanta.

Odontological Society of Pennsylvania.

The thirtieth annual convention of the Odontological Society of Western Pennsylvania was held at Pittsburg, April 12, with a large attendance.

The forenoon session was devoted very largely to oral hygiene and public dental education exhibit, and the members of the society busied themselves with explaining the many different features of this part of the convention. Large numbers of the representatives of the public schools of the city are interested in this feature and took occasion to be present and become acquainted with the advanced methods of modern dentistry.

The program for the afternoon included a report of the committee on the president's address and the annual report of the section on oral hygiene and public dental education. Dr. S. M. Stauffer delivered an address on ''The Dentist as Guardian of the Gateway of Nutrition.'' The discussion which followed was led by Dr. H. J. Horner, Dr. A. G. Reinhardt and Dr. W. S. Cook.

Dr. D. Willard Flint spoke on ''Some Vital Considerations.'' The discussion of the address was participated in by Dr. G. F. Bowman, Dr. L. G. Singleton and Dr. W. H. Fundenberg. The afternoon's program closed the sessions of the convention.

THE MICHIGAN STATE MEETING.

Largest in The History of the Society—Program Full of Good Things Well Presented.

The annual meeting of the Michigan State Dental Society was held, as announced, at Grand Rapids, April 10, 11 and 12, and was very largely attended. Those in attendance pronounce it to be the largest and most interesting meeting in the history of the society.

The principal essayists were Drs. M. L. Rhein, New York, on ''Scientific Treatment of Root Canals;'' F. C. Brush, New York, on ''The Business Side of Dentistry;'' C. J. Lyons, Jackson, Mich., on ''Surgical Procedure for Cleft Palate;'' Russell W. Bunting, Ann Arbor, on ''Constructive Changes in Pulp Tissue;'' J. M. Thompson, Detroit; Henry D. Watson, Grand Rapids; James H. Armstrong and John C. Nolan.

Dr. W. H. Taggart gave an interesting talk on ''New Things in Casting.''

There were five clinics from outside the state and seventy within the ranks of the Society.

All papers, addresses and discussions will appear in later issues of THE DENTAL SUMMARY.

Baltimore, March 26.—The members of the Maryland State Dental Association sat down to a splendid spread on the occasion of their annual banquet at the Hotel Rennert last night. In the afternoon the dentists repaired to their headquarters, in the Baltimore Medical College, and held their quarterly clinic. Eleven lectures were delivered by as many doctors on subjects ranging from the Attachment of Porcelain Crowns to Bridge Abutments.

The speakers at the dinner were Dr. A. Hrdlicka, curator of anthropology at the Smithsonian Institution, whose subject was ''Dentition and the Teeth in Indians and other Races;'' and Prof. J. D. Blake, who spoke on ''Oral Surgery.'' Dr. Hrdlicka has just completed a three year tour of the world, seeking data on his subject, and his remarks, while extremely technical, were decidedly interesting. He showed the differences in the teeth of persons of the white, yellow and black races, and to prove his arguments exhibited skulls and jaws and other bones which he had gathered.

Indianapolis, April 2.—About forty members of the Xi Psi Phi Dental Fraternity attended the sixteenth banquet of the fraternity held last night at the Denison Hotel, under the auspices of Theta Chapter, Indiana Dental College. The toastmaster was Dr. E. O. Hall, The speakers follow: Dr. E. I. Kellams, Dr. H. N. Turney, Dr. R. M. Hubbard, Dr. C. D. Ross, Dr. J. E. Davidson, Dr. Marq Smith, Dr. I. L. Furnas, Dr. I. L. Kercheval, Dr. W. H. Stephens, Dr. Blain Eastman, Dr. J. Rhodes, Dr. I. A. Hill, Dr. P. A. Kellar and Dr. C. T. Messner.

Dayton, Ohio, April 4.—Officers for the ensuing year were elected by the Miami Valley Dental Society Monday evening, as follows: Dr. Z. N. Wright, president; Dr. J. S. McCampbell, Xenia, vice president; Dr. F. E. Dano, recording secretary; Dr. E. B. Tizzard, corresponding secretary, and Dr. N. B. Custer, treasurer.

Dr. W. H. Wright, of Ironton, conducted a clinic on bridgework, and Dr. L. C. Weimer, of this city, read a paper on ''What I Owe to Dentistry.''

South Dakota Board of Dental Examiners

The South Dakota State Board of Dental Examiners will hold its next meeting at Sioux Falls, S. D., Tuesday, July 11th, 1911, at 1:30 P. M., and continuing three days. All applications for examination, together with a fee of twenty-five dollars, must be in the hands of the Secretary by July 1st. Applicants who have not complied with the above will not be permitted to take the examination. For further information, blanks, etc., address, Aris L. Revell, Secretary, Lead, S. D.

Toronto, April 5.—The closing dinner of the season of the Toronto Dental Society, held last night, partook of the nature of a ladies' night. The feature of the evening was an address on ''Heritage,'' by Dr. D. J. Goggin. Several solos were contributed by Mr. Arthur Blight.

The election of officers for the ensuing year resulted as follows: President, Arnold D. Mason; first vice-president, C. A. Kennedy; second vice-president, W. E. Willmott; secretary, Chas. G. Scott; treasurer, C. H. Clarkson. Over eighty were in attendance.

Southwestern Michigan Society.

The Southwestern Michigan Dental Society at its meeting in Grand Rapids during the State Society meeting, decided to hold its annual meeting on the second Tuesday and Wednesday in October, 1911. An invitation is extended to the Third and Fourth District Societies to meet with the Southwestern Michigan Dental Society for the purpose of amalgamating the three societies and affiliating with the State Society. R. E. Patterson, Secy.

Arkansas State Board of Dental Examiners

Next meeting of the State Board of Dental Examiners will be held June 5th and 6th, 1911, at Pine Bluff, Ark.

All applicants are required to pass a theoretical examination; fee, $15.00. Examination covers all branches taught in dental schools. No temporary license issued. No interchange with any state. A. T. McMillin, secretary-treasurer, Little Rock, Ark., 405 and 406 State Bank Building.

Association of Dental Faculties.

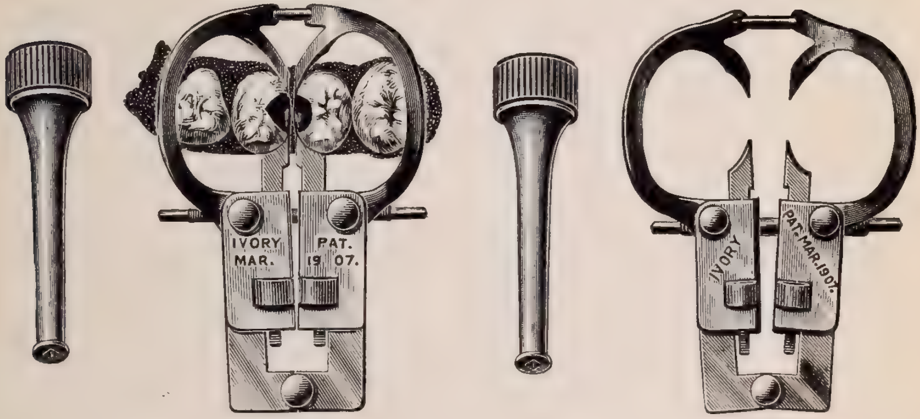
The next meeting of the National Association of Dental Faculties will take place at the Hollenden Hotel, Cleveland, Ohio, Saturday, July 22, 10:00 A. M. the Executive Committee will meet at 9:00 A. M. the same day.

Anyone having business to transact with the committee will please present it at that time. B. Hally Smith, Chairman Executive Committee.

Philadelphia, March 31.—Former Provost Charles C. Harrison and Dean Edward C. Kirk, of the dental school of the University of Pennsylvania, went to Scranton yesterday and were guests of honor last night at the annual banquet of the Lackawanna County Alumni Association. Doctor Harrison answered the toast, ''The University,'' and Dean Kirk spoke upon ''The Dental Department.''

Ivory's Adjustable Separator

Patented March 19th, 1907



THE jaws of each ½ of the separator working independently allows for the difference in the size of the teeth, gives a wide range for the adjustment of the jaws where the teeth are irregular, and a perfect control over the jaws so that they need never interfere or cover the margins of the cavity. The spreading force is many times slower than the ordinary screw force, no binding of the screw is possible, and its action is the most powerful screw force known.

Because the control of the jaws is completed, the movement of the spreading force so slow and evenly divided and the sense of touch perfect, the pain in separating the teeth is reduced to the minimum. It is universal for all operations extending beyond the first molars working on either side of the arch by changing the thumb nut.

PRICE FOR EACH $5.00

J. W. IVORY, 21-23 N. 13th St., Philadelphia, Pa.

LAKE ERIE DENTAL ASSOCIATION

at Vanadium Hotel, Cambridge Springs
May 16 to 18, 1911

The Lake Erie Dental Association will hold its Annual Convention.

A glance at the names on the program and the subject to be covered by each will convince all that this is a meeting which none can afford to miss.

PAPERS

Dr. Geo. H. Wilson, Cleveland, Ohio	Prosthesis
Dr. Rudolph Beck, Chicago, Ill.	Bismuth Paste
Dr. Kanaga, Philadelphia, Pa.	Crown and Bridge

SYMPOSIUM

Each Speaker Ten Minutes

Dr. O. L. Hertig, Pittsburg, Pa.	Gold Filling
Dr. W. L. Fickes, Pittsburg, Pa.	Porcelain Inlay
Dr. L. B. Moore, Pittsburg, Pa.	Gold Inlay

CLINICS

We expect to have the largest number of clinics in the history of the association. Details of the entire meeting in program which will be sent to you about May 1.

MARK OFF THE TIME NOW AND COMMENCE TO BOOST

Another Link in the Chain

Members of the Dental Profession contiguous to Grand Rapids will be pleased to know that we have opened a fully equipped and adequately manned

Dental Laboratory

in connection with our Grand Rapids House, and are now prepared to execute promptly and in the best manner known to the art all cases intrusted to us.

This new venture starts with the advantage of several years' laboratory experience, and we ask for it the same kindly reception, liberal patronage and confidence that have been accorded to our other laboratories at Toledo and Cleveland.

Grand Rapids has many advantages as a distributing center, permitting an entirely satisfactory degree of promptness in receiving and filling orders; while our efforts to satisfy all shall be unremitting, not only in expedition but in quality of product as well.

Very respectfully,

THE RANSOM & RANDOLPH CO.

407 The Gilbert, Grand Rapids
April 10, 1911

Indianapolis, April 4.—Textbooks and their study formed the subject of the discussion last night at the regular monthly meeting of the Indianapolis Dental Society, held at the Dennison Hotel. The discussion followed a paper on "Why Dentists Don't Buy Books," read by Dr. Harry Carr. The paper was read following the regular 6 o'clock dinner. Dr. Ray Kibler was chairman of the meeting.

Pennsylvania State Board of Dental Examiners

The next meeting of the Pennsylvania Board of Dental Examiners will be held on June 14, 15, 16 and 17, 1911, in Philadelphia and Pittsburg, simultaneously. For further information, address Dr. Nathan Shaeffer, Supt. Public Instruction, Harrisburg, or Alexander H. Reynolds, Secretary, 4630 Chester Ave., Philadelphia.

Ottumwa, Ia., March 29.—The Ottumwa and Burlington districts of the Iowa State Dental Society closed their two days' joint session here after electing the following officers: Ottumwa district: president, H. H. Gantz, of Albia; vice-president, B. F. Redman, Oskaloosa; secretary, W. S. Goldsmith, Ottumwa; treasurer, J. M. McEvey, Ottumwa.

North Carolina State Board of Examiners

The regular annual meeting of the North Carolina State Board of Dental Examiners will be held at Morehead City, N. C., beginning promptly at 9:00 on the morning of June 26, 1911. For further information address the secretary, Dr. F. L. Hunt, Asheville, N. C.

Providence, March 22.—The Rhode Island Dental Society held a quarterly meeting last night at the Crown Hotel. Reports were received from committees and a general discussion of the points involved was held. Dr. James E. Heap, president of the society, presided. About 40 of the members were present.

The Delta County Dental Society was organized at Escanaba, Mich., March 16, and elected the following staff of officers: C. M. Cuthbert, president; R. E. Hodson, vice-president; Roy H. Ranks, secretary-treasurer. Meetings are to be held monthly. Dentists of Schoolcraft county are to be invited to unite.

The Tuscaloosa County Association met at Tuscaloosa, Ala., March 17, and elected D. B. Patton, president; O. S. Spain, vice-president; R. J. Monette, secretary and treasurer. An effort is being made to secure the meeting of the state society for Tuscaloosa.

The Northwestern District Society met at Grand Island, Neb., March 22, and elected the following officers: S. A. Allen, North Loup, president; L. A. Chambers, Gothenberg, vice-president; John Denzier, Kearney, vice-president. The meeting terminated with a banquet.

The Southwestern Minnesota Society held a three-day session at Mankato, beginning April 10. It was the twenty-sixth annual, and was largely attended. Dr. J. N. Prothero, of Chicago, was the principal speaker from outside the state.

The annual banquet of the Seventh District Society was held at Port Huron, Mich., March 23. Dr. Geo. H. Brown acted as toastmaster, and the enjoyable occasion was enlivened by the presence of the ladies.

The fourteenth semi-annual meeting of the Champaign-Danville Society was held at Champaign, Ill., March 14. Features of the meeting were: inspection of the University, and a concluding banquet.

The dentists of Orleans, Monroe and Niagara counties, N. Y., have organized a tri-county association.

The Lehigh Valley Society met at Easton, Pa., March 20. The next meeting is to be held at Allentown.

DEATHS.

Boston, March 24.—Edward Walter Branigan, D. D. S., A. M., professor of clinical dentistry at Tufts College Dental School, died late this afternoon of heart failure. As a professor of operative dentistry at Tufts for many years he became one of the best known men in his profession in the country. For twenty-five years he had contributed much to the science of dentistry and especially in its bearing on the teeth of children. He was 53 years of age.

Dr. Branigan was a trustee of the Forsythe Dental Infirmary and one of those instrumental in securing from Mr. Forsythe the million and a half donation for its establishment. Last year he was president of the National Association of Dental Faculties, having been elected at its convention in Denver. He was the author of several works on dentistry and an authority on operative dentistry.

At Philadelphia, March 20, Dr. Abraham M. Wolfe, a well-known dentist and worker for social betterment, was struck by a train and literally ground to pieces. The remains were gathered up in a bag, and were entirely beyond recognition. Dr. Wolfe sprang from in front of a train approaching on one track only to land in front of another coming from the opposite direction on the other track.

Dr. William Park, of Fredonia, N. Y., died at his home there March 27. He had practiced dentistry in New York for half a century, and was the first dentist in the United States to invent a fluid used in the painless extraction of teeth. Dr. Park was prominent in Masonic circles.

Elmira, N. Y., March 30.—Dr. Richard L. Kerr, of this city, died this morning at the home of his son in Philadelphia, after an extended illness. He was a veteran of the Civil War, and prominent in G. A. R. and other veteran organizations.

Dr. Frederick S. Brenisholts, a prominent citizen and dentist of Waynesboro, Pa., died at his home, April 6 of acute indigestion. He was 72 years old, and one of the best known and beloved residents of his city.

The funeral of Dr. Robert Weston Talbott, one of the oldest dentists in Washington, D. C., was conducted by the District Dental Society, March 13. He had practiced in Washington for thirty years.

At Prescott, Ont., March 23, occurred the death of Dr. Allen J. Smith. He had been a practicing dentist in Toronto for twenty years.

Dr. James A. Priest, Utica, N. Y., April 12, of pleuro-pneumonia, aged 62. Dr. Priest stood high in the ranks of the profession in his part of the state.

Dr. Roderick M. Sanger, East Orange, N. Y., April 16, of arterio sclerosis.

ROBBERIES.

Belle Plaine, Ia., April 1.—Special: The office of Dr. F. B. Collins, a dentist, was entered and about $60 worth of gold, a gold watch and other articles stolen. By means of the number of the watch, Michael Welch was caught at Boone, Marshal Ruhl bringing him here, where he waived examination. He was taken to jail at Vinton.

Poughkeepsie, N. Y., April 7.—Burglars entered three of the offices of local dentists Wednesday night and ransacked the places for booty. The offices of Dr. J. E. Patterson, M. F. Downing and G. A. Northrup were plundered. But small losses are reported.

Dover, Del., April 3.—The dental offices of Dr. S. B. Johnston & Son were entered last night, and gold to the amount of about $100 was taken. Other goods worth about $50 were destroyed. An attempt was made to blow the safe, but it was unsuccessful.

Kenosha, April 5.—The offices of Dr. George E. Stephens and T. C. McGrory, dentists, were entered by burglars during the noon hour today, and the burglars got away with nearly $200 worth of gold leaf and jewelry.

Lexington, Ky., April 2.—The glass case used as a sign by Dr. J. T. Slatten was smashed Friday night, and several sets of teeth, plates, bridges and crowns abstracted. The value was light.

DENTAL TROUBLES.

Mrs. John A. Crotty died in a dental chair at Wilkes-Barre, Pa., as the result of the administration of chloroform, March 27. A physician had examined her heart before administering the anesthetic; it was administered by the physician and not by the dentist; the patient came out of the anesthesia successfully, and the heart was found to be beating normally. In a few minutes, however, the heart suddenly ceased to beat, and the poor woman was dead. Hours were spent by several physicians in an effort at resuscitation, but without avail.

Richmond, Va., March 23.—Dr. G. H. Grear, of Olive Hill, Ky., and one J. P. Speer, of Lebanon, Va., have been convicted and sentenced to pay fines of $500 each for conspiring to obtain a dental license by fraud, permitting one of them to practice in Virginia. It is charged that Grear represented himself as Speer, passed the necessary examination, secured the license and turned it over to Speer.

Lafayette, Ind., March 31.—Within an hour after his arrest for a series of bold daylight robberies, Herbert George Lee, 33, said to have been a widely known dentist of Des Moines, Ia., was sentenced to the state prison for from one to fourteen years here yesterday. He came to Lafayette representing himself as a magazine agent.

THE DENTAL SUMMARY

The Magazine That Helps

Vol. XXXI JUNE, 1911 No. 6

OFFICIAL ORGAN:

The Ohio State Dental Society
The Michigan State Dental Society
The Indiana State Dental Society
The Kentucky State Dental Society
The Louisiana State Dental Society
The West Virginia State Dental Society
The Northern Ohio Dental Society
The Northern Indiana Dental Association
The Eastern Indiana Dental Society
The Southwestern Michigan Dental Society
Odontological Society of Western Pennsylvania
The Lake Erie Dental Society

and Several Local Dental Societies.

Editorial Office; 1255 Neil Avenue, Columbus, Ohio
L. P. Bethel, M. D., D. D. S., Editor-in-Chief

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REGULAR CONTRIBUTIONS

PATHOLOGY AND TREATMENT OF ALVEOLAR ABSCESS AND A PLASTIC OPERATION TO CLOSE NASO-ORAL FISTULA AND A NEW OPERATION FOR MANDIBULAR NECROSIS*

By Stewart L. McCurdy, M. D., Pittsburg, Pa.

THE capital operation of dentistry is devitalizing pulps and filling of the root canals, as an abdominal section, or the opening of an important joint is the capital operation of surgery.

If the peritoneal cavity or synovial membrane is infected during an operation, serious and dangerous inflammatory processes follow; infections of the former in many instances result in death, and infections of the latter result in ankylosis and even amputation. It is possible for the general surgeon to perform the operations without mortality only because of the great

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*Read in the Section on Stomatology, of the American Medical Association, of which The Dental Summary is the representative organ for the dental profession, by special arrangement with the *Jour. Amer. Med. Asso.*

care exercised by him preparatory to and during the operation. On the other hand, the most delicate operation in dentistry, requiring the most technical skill as well as demanding perfect asepsis in its practice, is the devitalizing and extracting of pulps and filling these cavities. If infection occurs on account of carelessness on the part of the dentist, the too common alveolar abscess is the result. Alveolar abscess, or the so-called pus sac so frequently found on the apex of a tooth after extraction, is the forerunner of 90 per cent. of all the destructive diseases of the maxillary bones.

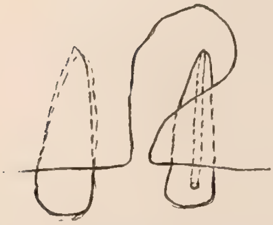

Fig. 1.—The most common alveolar fistula of the maxilla. Usually persists for years until the tooth is extracted.

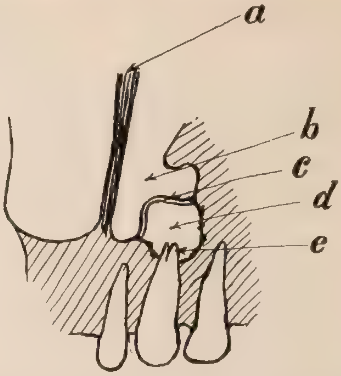

Fig. 2.—This represents the method of establishment of naso-oral fistula; a, nasal septum; b, nasal cavity; c, membranous floor; d, abscess cavity; e, denuded root of tooth.

SERIOUS CONSEQUENCES OF ALVEOLAR ABSCESS

The pathologic changes which occur in the so-called alveolar abscess begin at the apex of the root of a tooth. The first change is quite small. beginning in the form of an infiltrate, which later liquefies. This change involves the tissues immediately around the apex of the root either destroying or promoting the absorption of the bone. The process of the destruc-

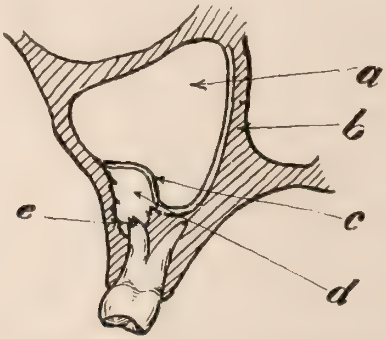

Fig. 3.—Abscess; a, antral cavity; b, naso-antral septum; c, membranous floor of the antrum; d, abscess cavity ready to rupture into the antrum; e, root of tooth denuded and cause of disease.

tion is in the direction of the least resistance from the root involved, which experience demonstrates to be smaller on the buccal side of the alveolar process. The destruction continues to the surface of the bone when the external manifestation of the abscess is present, namely, a fluctuating tumefaction on the external surface of the bone. This continues to destroy tissue in proportion to its activity, which depends on the variety of germ responsible for the disease.

The symptoms are well known to every dentist. Pain is in proportion to the rapidity of the course and, as a rule, is not prominent, a slight ache of the face being the most common characteristic.

If the root of the tooth affected is in proximity to the maxillary sinus, this cavity will be infected, resulting in antral disease. Occasionally when the disease is in the mandible in proximity to the central canal a great portion of the bone will become involved before the surface is reached and the ordinary fluctuating cyst described above is not found.

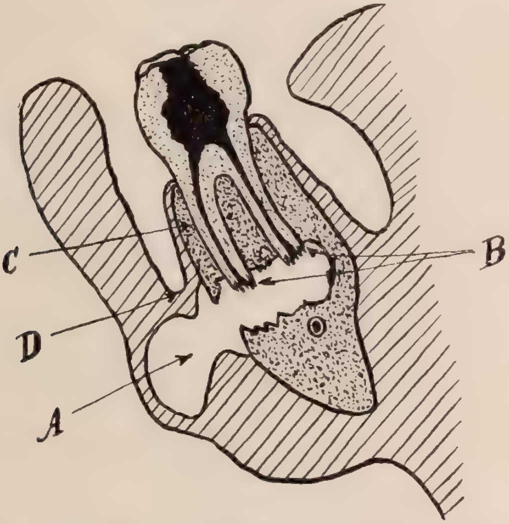

Fig. 4.—Alveolar abscess of the mandible; A, abscess cavity; B, roots of tooth; C, external alveolar plate to be removed with tooth; D, point of incision.

In many of these abscesses the bony floor of the antrum is destroyed, yet the antral cavity is not entered because the membranous floor is still intact. If the distention of the abscess cavity is great or if it continues for a considerable length of time, the nasal or antral cavity will be entered and in the former instance the antrum becomes infected, and in the latter instance a nasal fistula established.

When a fistulous opening is established from one of these abscesses, the orifice may be through the alveolus, the external or internal surface of the bone. In cases of fistulas communicating with a cavity in which there was the root of a tooth denuded of its periosteum and apical circulation I have not seen the opening close without the extraction of the tooth. This applies to chronic openings persisting for three or more months.

An alveolar abscess of the mandible is rather common. It is usual, also, for the abscess to break through the cheek rather than into the oral cavity. It is all a question of dependent drainage. The reason that alveolar abscesses of the superior bone repair better than those below is that the drainage above is superior.

The second serious consequence of alveolar abscess is a more grave variety of destruction of the maxillary bone, when the nasal floor, membranous and osseous, is destroyed, leaving a naso-oral fistula. In this condition we have a very troublesome complication, making it necessary for the patient to keep the opening packed constantly, requiring removal after meals and withal leaving the mouth in a very unsanitary condition.

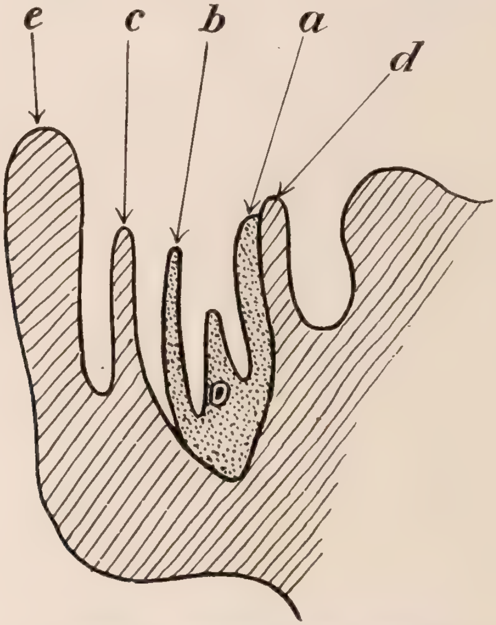

Fig. 5.—The above illustration represents Case 1 described in the text; a and b, alveolar process on two sides of tooth; b, denuded; c, detached gingival tissues; d, lingual gingival tissues; e, lip.

The underlying factor in nearly all of these cases is syphilis and, after the constitutional treatment has been pushed until all granulating surfaces have repaired, it is very desirable to close the opening permanently.

OPERATION AND CASE REPORTS

An operation which I have done in several instances and which has accomplished this purpose may be described as follows: Assuming that the labial gingival structures are completely destroyed and that the lingual periosteum and mucous membrane extend well down to the normal line, two incisions are made through the lateral structure, either with scissors or knife, back up to the orifice of the fistula and far enough back on the two sides to make the tongue wide enough to cover the opening. The margin of the flap thus made is freshened and the corners made round. The next step is to freshen the orifice of the fistula, denuding well the internal surface of the lip for a distance equal to the thickness of the flap. The flap is now turned up over the orifice of the fistula and sutured there with silkworm gut. In the three cases in which the operation has been performed (two of which are described below) the results have been perfectly satisfactory.

Case 1.—*Patient.*—A man, aged 50, with infection of the mandible. He had lost all of his lower teeth but three, and the cavity included practically all of the mandible on its external surface, the bone being bare throughout. The alveolar process, on its external margin, including the cavities left by the extracted teeth, stood out perfectly nude in the floor of the mouth. It had required just a month for the case to advance to the condition described.

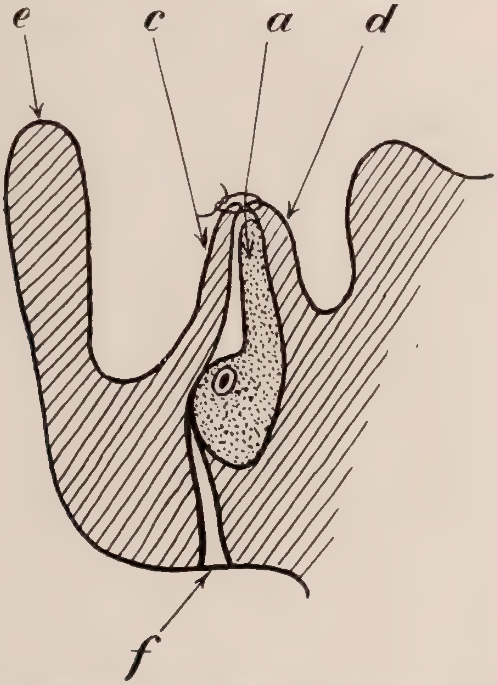

Fig. 6.—The above illustration shows method of obliteration of a, alveolar cavity; a and b, alveolar process; b, bone has been removed; c and d, approximated and sutured; e, lip; f, external drainage.

Operation.—This included a complete removal of the external half of the mandible from the second molar on the right side to the second bicuspid on the left, through the roots of the teeth and to external inferior margin of the bone. This left the internal alveolar plate intact throughout with the periosteum undisturbed. The cavity was mopped out with pure tincture of iodin. The usual method of procedure would doubtless have been to pack the entire cavity, with the hope that the bone would heal by being granulated over from later approximation of the external periosteum. It was decided, however, that such an extensive cavity should be immediately obliterated. Dependent drainage was absolutely necessary if this was to be accomplished; hence an incision was made from the lowest point of the cavity in the median line through the skin under the chin large enough to admit a rubber drain the size of a lead pencil. The next step was to stitch together with catgut the labial and buccal gingival margins, thus closing off the field of operation entirely from the oral cavity.

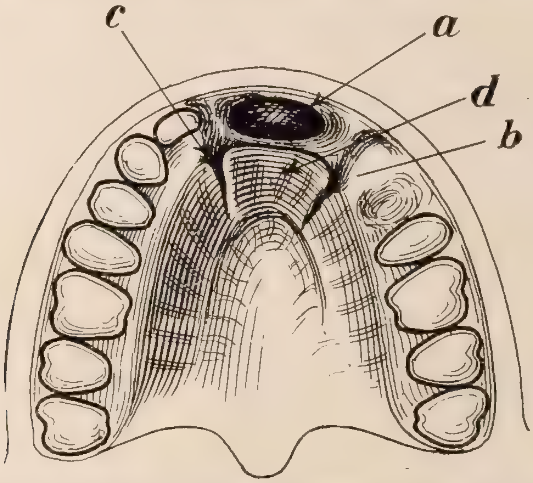

Fig. 7.—The above illustration represents method of closing naso-oral fistula; a, opening into nose; b and c, incisions; d, flap to be turned upward and outward over a.

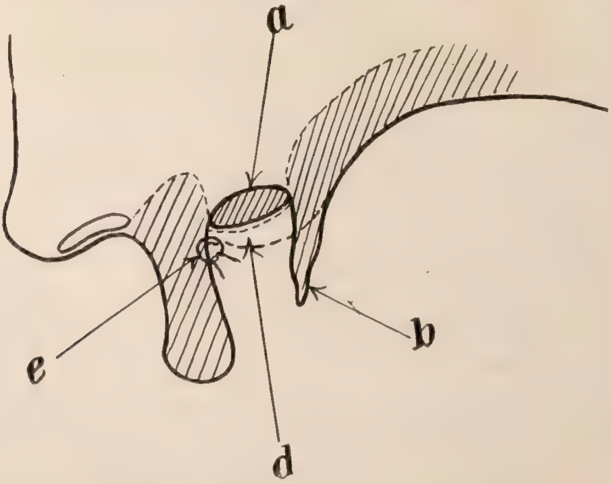

Fig. 8.—Completed operation; a, fistula with flap over it; d, flap in new position; e, sutures.

Postoperative History.—To my intense gratification the two gingival margins did completely unite and not a drop of pus was ever found in the oral cavity. The drainage established from below was quite sufficient to carry off the small quantity of reparative lymph and detritus and the patient was practically well in ten days after his operation.

CASE 2.—*Patient.*—A man, aged 30, had extensive infection of the mandible beginning from an infected tooth. Seven or eight teeth had been extracted and the entire external surface of the mandible was bare. The oral cavity was welling full of pus from the extensive suppurating area. The disease had developed rapidly and was running an acute course.

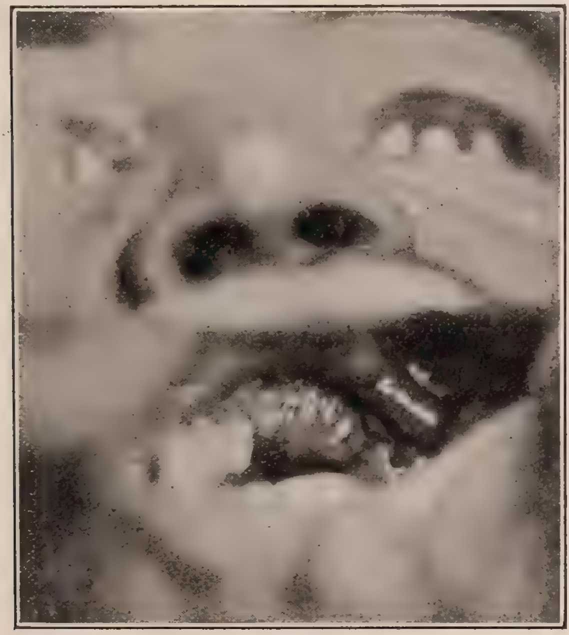

Fig. 9.—Taken after operation in Case 1.

Operation.—This was practically the same as that performed on the above case. After the removal of the external half of the bone and disinfection of the wound, drainage was established through the skin under the chin. The gingival margins were approximated by catgut sutures.

Postoperative History.—The openings did not unite throughout as in the former case; two or three openings communicated with the mouth. This case was no doubt syphilitic and constitutional treatment was administered before the disease could be controlled. It was several months before the system was impressed with the medication and the wound closed.

CONCLUSIONS

1. Dentists should realize the seriousness of the most frequent operation they perform, namely, that of devitalizing and extracting pulps, since infection and serious bone destruction originate from this cause.

2. Destruction of the bony floor of the antrum does not necessarily mean perforation of the membranous floor or infection.

3. An alveolar fistula leading into a cavity where a considerable portion of a tooth is exposed requires extraction of this tooth before complete recovery can be expected.

4. Persistent headaches and general reduction in health are frequently caused by very insidious alveolar abscesses.

5. In destruction of the mandible, requiring removal of bone, it is advisable to establish drainage through the chin and approximate the gingival margins with sutures so as to shut off a pus cavity from the oral cavity.

6. Naso-oral fistula may be closed by a membranous flap from the roof of the mouth.

7. In all suppurative conditions of the mouth pure tincture of iodin should be used as a disinfectant.

DISCUSSION.

Dr. G. V. I. Brown, Milwaukee: Dr. McCurdy, being a skilful surgeon, has simply applied correct surgical plastic methods to oral operations, and that, I am sorry to say, is something which is not always done in this work. The way Nature is obliged to help out in the closure of openings by granulation and that sort of thing is a matter to be deprecated and in a corresponding way any suggestions leading to correct surgical closure are in the right direction.

Dr. William C. Fisher, New York: In this synopsis a statement is made that probably one-half the cases of necrosis of the maxillary bones are due to syphilis. I think probably one thing is lost sight of, and that is that the administration of mercury for syphilis very often starts up symptoms for which the disease is blamed. We can get the very same symptoms from the administration of mercury that are caused by syphilis.

Dr. James E. Power, Providence, R. I.: To me it seems unnecessary to make an incision such as described by the essayist. As I understand the operation, the doctor draws the flap across the opening at the top, within the oral cavity, and then makes an incision below and on the external surface for drainage. I do not think that one is justified in making an external incision on the face, and surely not in a case like the one described. I do not quite see any disadvantage in proper drainage through the mouth, even in view of the fact that there may be bacteria present which are capable of causing trouble in the alimentary canal. With the external incision, even if he gets union within the oral cavity by first intention, some days will elapse before he gets a sufficiently strong union to prevent back drainage. I believe that the term syphilis is getting to be used in the medical profession about the same as neuralgia in the dental profession. It seems that about every condition which is beyond the diagnostic capabilities of the practitioner is pronounced syphilis. I am conscious of the prevalence of syphilis, but I believe that many mistakes are made. From my experience I would not care to accept the statement in the matter as final, that over one-half the cases of necrosis of the superior maxilla were due to syphilitic conditions. A good many times the argument for the diagnosis of syphilis is simply that the condition improved under potassium iodid. We all know that many conditions will improve under potassium iodid. Without a good history the only true test is the Wassermann reaction, and that is very seldom resorted to by the general practitioner because it is a complex process and requires the skill of a laboratory expert. Dr. Fisher says that he believes that many of the cases of para-syphilitic conditions are due to the drugs. I believe, however, that all conditions that come from treated syphilis are from the disease and not from the drug. We might get a profuse flow of saliva from too much mercury, but I do not believe that we get necrosis of bone, gummata and other pathologic manifestations which are associated with syphilis and which are erroneously attributed to the use of the drug. I believe 100 of the para-syphilitic conditions are due to the disease where but one is due to mercury. My authority for this statement is Dr. Charles M. Whitney, of Boston. I am speaking of cases properly treated. Of course, if a practitioner continues to use mercury after symptoms show that the drug should be suspended he is likely to be confronted with serious conditions. Salivation was used as the indicator in the early days of the treatment of this disease, but that day has passed. They are treating syphilis more scientifically today. It is seldom if ever that a syphilologist will permit a patient to reach the stage of profuse salivation.

Dr. Eugene Talbot, Chicago: I have failed to see in any work the proper pathology of alveolar abscess. While I may not be correct, I have an idea of the process taking place and I may be able to add some point which has not yet been recorded, and I have made a number of drawings on the board to give a general idea of what I intend to present. Most individuals who have alveolar abscesses are run down. In case of syphilis, mercurial, or any other drug poisonings, there is a want of tonicity of the nervous system, in all cases, we may say, due to irritation. When irritation takes place the peridental membrane becomes involved and inflammation is set up, which causes pressure pain around the root of the tooth. With this pressure, inflammation is set up in the arteries of the bone, the Haversian canals and in the vessels of von Ebner. That inflammation causes absorption of the bone proper, leaving the fibrous tissue (trabeculæ) as you see it in the diagram on the board. This might be likened to the plastering on the side of a building. If it were not for the lathing the plastering would not stick. If the lathing (trabeculæ) be removed, then the alveolar tissue or bone cannot be restored. The extent of formation of this abscess depends entirely on the amount of irritation and also on the weakened condition of the patient. It may go on, extending down into the bone tissue through these canals, and the bone proper (that is, the bone-cells which are held together by fibrous tissue) is absorbed, leaving the fibrous tissue intact. This fibrous tissue becomes organized and forms the sac of the abscess. The inflammation extends through these Haversian canals and produces absorption outward, just as when pebbles are thrown into a small lake, the waves enlarge and spread outward, and if you throw several pebbles into the lake at different localities these waves extend until they coalesce. The principle of bone absorption is the same. Absorption goes on around each Haversian canal until the entire area is involved, and we not only have absorption going on in the Haversian canals, but the vessels of von Ebner become involved. These are not so large as the Haversian canals, so the process of absorption takes longer, but the principle is the same. It burrows right through the bone.

Dr. Frederick Noyes, Chicago: The absorption of bone under the conditions just stated may be considered as a response to a mechanical condition of pressure, which is the result of the exudate which comes from the inflammation, and the absorption occurs in all the spaces of the bone in the neighborhood of the inflammation.

Dr. C. W. Harned, Iowa City, Iowa: There is just one word I would like to say as to closing of these wounds. I think anyone who has made a practice of closing wounds to prevent secretions of the mouth getting into them will never give it up. I never fail to close up a cavity if possible, after removing all necrotic tissue. I think such wounds will seal in 36 hours, so that no saliva will get into the wound. Pus is rarely present after all the necrotic tissue has been removed. I want to commend the essayist for making this point in the matter of drainage.

Dr. James E. Power, Providence, R. I.: The last speaker states that in his antral diseases he cleans the antrum and then closes the opening through which he operated. In all the antral cases which I have treated I have been obliged to follow the currettage treatment with irrigation. I would like to know how he irrigates if he closes the opening, or what procedure he follows.

Dr. C. W. Harned, Iowa City, Iowa: I prefer going in above the bicuspids, when I think disease involves the antrum. Thorough ventilation as well as drainage through the nose on that side is important. I make an opening through the internal wall of the antral cavity into the meatus, after the antrum is cleansed. Close up the mucous membrane on the outside after you have packed. Remove packing the next day through the nostril. Always close mucous membrane on the outside immediately, and irrigate as little as possible. I find that when I irrigate the least the patients get along the best. If all the pus and necrotic tissue is removed, and the cavity sterilized, very little irrigation will be found necessary.

NORMAL OCCLUSION IN CROWN AND BRIDGE-WORK USING METALLINE.*

By F. C. Furniss, D. D. S., Canal Dover, Ohio

THE restoration of the natural teeth by the use of artificial crowns and the supplying of missing teeth by bridgework comprises a very large part of the average work of the dentist. A desire to diminish the time required ordinarily in the performance of work of this character as well as an effort to render crown and bridgework more artistic as well as efficient, led me to give this clinical demonstration.

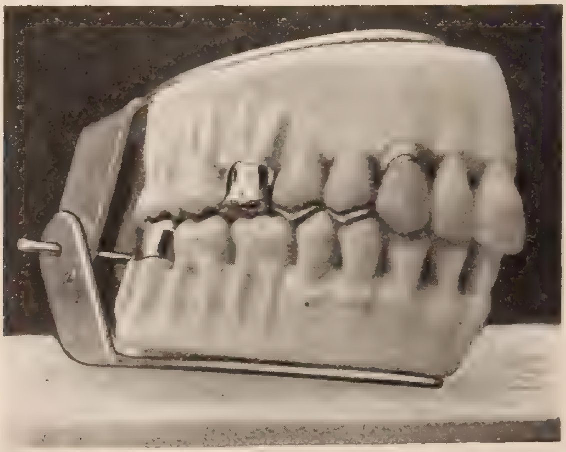

Fig. 1.

A bridge was constructed upon a typodont. It consists of a molar shell crown, two bicuspid dummies and a cuspid crown having porcelain facing, iridio-platinum post and cast gold base. (Fig. 1.)

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*Given as a clinic at Ohio State Dental Society, 1910.

The technique for the shell crown is as follows: The tooth to be crowned is prepared by grinding so that the greatest diameter of the tooth is at the cervical margin. In order to secure correct proximal contact and natural contour, the band is formed as shown in Figs. 2 and 3. This gives a cone-shaped band instead of a cylinder, and adds greatly to the beauty and efficiency of the crown when finished. This band is fitted to the tooth, allowing sufficient space for the cusp. While the band is on the tooth, soften a piece of Metalline Carving Compound over the flame, and place it on the end of the band, instruct the patient to close the mouth until all teeth are in occlusion. The patient is then told to open the mouth and band is removed, being careful not to separate the cusp from it. After chilling in cold water, the cusp may be carved. The best instrument for this carving is one illustrated in Fig. 4. The carving may be polished with a stiff brush and the margin where the cusp joins the band can be nicely finished with a file. If necessary, the band with carved cusp may be replaced upon the tooth in order to secure exact occlusion. The cusp is next removed from the band. The excess of Metalline extending within the band is cut away and finished by rubbing upon a flat file or sand paper. (Fig. 5.)

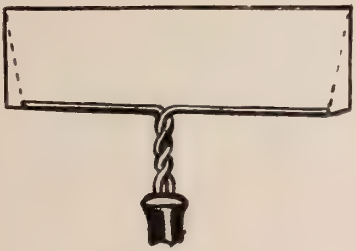

Fig. 2.

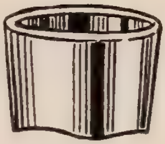

Fig. 3.

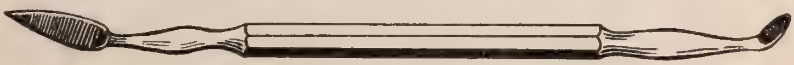

Fig. 4.

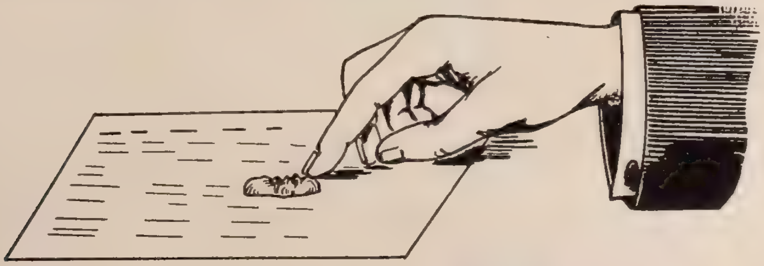

Fig. 5.

After giving the cusp a thin coat of glycerine, place it upon a piece of cardboard, place molding ring over it and pour in Mellotte's metal.

When cool, pick out the cusp. Swage cusp, trim to band margin, file smooth and solder cusp to band.

The cuspid crown was made as follows: The root was prepared as for an ordinary porcelain crown, excepting that the peripheral end was grooved to prevent rotation of the crown and to add to its stability. An iridio-platinum post was fitted into the root. A facing selected and ground to suit, and backed with 24 K. gold. A piece of inlay wax is softened and the facing and wax pressed firmly against the root. This is chilled with water, and the crown is carefully removed and carved. A sprue is fixed in place, the whole is invested, cast and finished. The crowns are now placed upon the teeth; bite and impression are secured and model made and mounted on an anatomical bridge articulator. (Detroit Dental Co.)

Select facings to suit the case. Grind them to fit space, allowing sufficient room for the cusps. Wax the facings to place, trim away wax from occlusal aspect and chill the remaining wax. Now soften another piece of Metalline, place on occlusal ends of facings and close the articulator. This will mark the occlusion, giving a perfect guide for the carving of the cusps. When cusps are carved, they can be removed from their places and a die poured, as was done in the case of the shell crown. Swage cusps, trim and flow full of 22 K. solder. Back the facings, allowing the backings to extend slightly beyond the facings at the labio-occlusal end only. This will facilitate the soldering of the cusp, assuring a perfect union of cusp and backing. The cusps are ground on their under sides to conform to the curve of the facing and backing. The piece is now waxed up. The dummies are removed with their cusps, invested, soldered and finished. They are replaced upon the articulator, waxed to place and the whole piece invested and soldered. When finished, the bridge will fit the teeth in the mouth. The articulation will be exactly right—no grinding of bridge or the patient's teeth necessary. The stress of mastication will be evenly distributed over the entire occlusal surface of the bridge, thereby adding to the efficiency and endurance of the bridge and also adding to the comfort of the wearer.

UNLIMITED opportunities are offered in the scientific field for good practical scientists and higher positions are awaiting skilled men. For all the three or four-thousand-dollar positions there are many capable candidates. But when it comes to the fifteen- or twenty-thousand-dollar positions it is hard to find the right man.—Thomas A. Edison.

SURGICAL TREATMENT OF CERTAIN TYPES OF CONGENITAL CLEFT PALATE.

By Chalmers J. Lyons, D. D. S., Jackson, Michigan
Assistant in Oral Surgery in the University of Michigan

(Continued from page 346, May Summary.)

Fig. 1 illustrates the type of cleft palate where union between the premaxillary portion and the maxilla proper has taken place on one side only, leaving a cleft separating the cuspid from the lateral incisor tooth and running back through the soft palate and azygos uvulae.

With this type of cases, hare lip always accompanies the deformity and the child is usually stronger at birth than it is for some time after, for the bifurcated lip together with the cleft in the palate makes it very difficult for the child to take proper and sufficient nourishment. Consequently, the child has a great tendency to lose weight and strength and it is only under the most favorable conditions that it is able to secure sufficient nourishment.

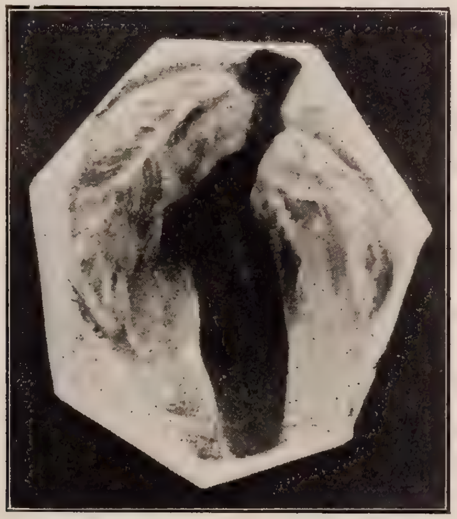

Fig. 1.

Our experience in the University Hospital has been that improvement takes place at once in a child's general health as soon as the anterior portion of the cleft in the palate and the cleft of the lip are closed, for the mouth and lip are then in a better condition for the child to take nourishment in a more nearly normal manner.

The principle involved in the surgical treatment of this type of cases is to mechanically force the anterior portion of the maxillary processes and the premaxillary process into normal position. This accomplishes a three-fold purpose. First, it straightens up the nose which has been deflected on one side. This is caused by the displacement of the vomer and premaxilla in this type of deformity. (Fig. 2.) The vomer being the lower portion of the nasal septum, the inferior border of the nose being attached to it is deflected to the side of the maxillary process carrying the premaxilla and the nose is deflected to that side. Fig. 3 shows anterior portion of cleft closed, showing nose straightened. Second, it brings the maxillary and premaxillary processes into normal relation so that when the teeth erupt they do so in proper alignment. Third, it reduces the cleft to a cleft of the soft palate, involving only a small portion of the hard palate. (Fig. 4 shows same case as Fig. 1 one year after operation.)

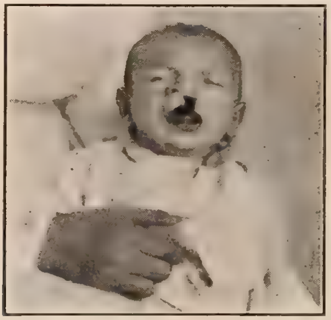

Fig. 2.

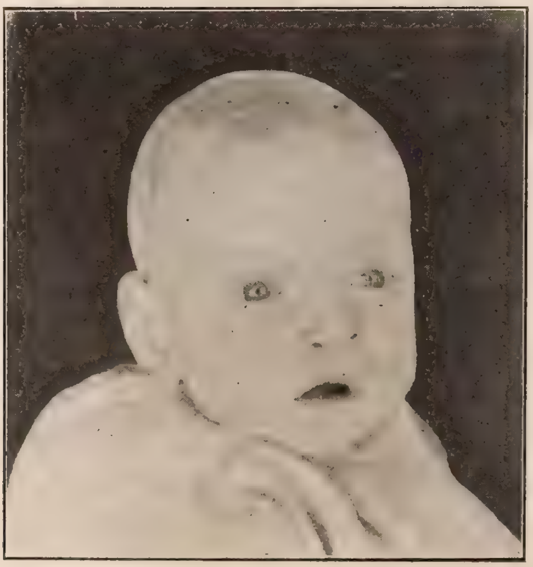

Fig. 3.

The technic of this operation is as follows: First, the mucous membrane on either side of the maxilla is dissected back so as to permit of the insertion of the silver tension wires as high on the buccal surfaces of the maxillary processes as possible.

These wires are inserted by passing a heavy bone needle with the proper curvature, threaded with heavy double silk suture, through each half of the maxilla, one anterior to the malar process and one posterior, inward from each side to the median line. Great care must be exercised that the point where the needle makes its exit, in the median line or cleft, is on the nasal surface of the maxillary process. This is necessary for three reasons: First, that the blood supply to these parts should not be interfered with by disturbing any of the branches of the anterior or posterior palatine arteries; second, that no cicatricial tissue should be made on the palatine surface that will interfere with the subsequent operation of closing the posterior portion of the cleft; third, greater tensions on the parts can be made by inserting the wires deep in the tissues.

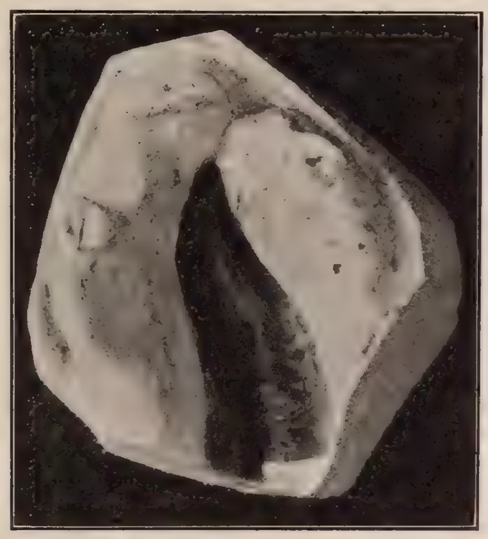

Fig. 4.

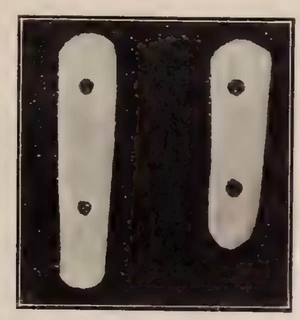

Fig. 5.

After these double sutures are inserted two on either side from buccal surface to median line, one of the anterior loops is passed through the other, and drawn through to the buccal surface on the opposite side so that one double suture extends from buccal surface to buccal surface. The posterior double sutures are treated the same and the two double sutures now extend from buccal surface to buccal surface, one anterior to the malar process and one posterior to it.

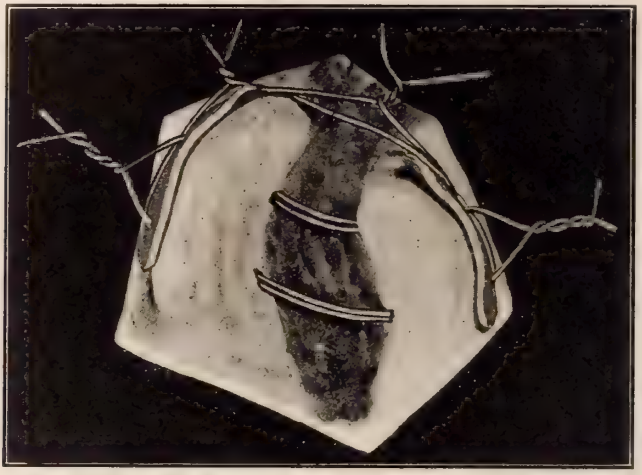

Fig. 6.

A double silver wire, gauge 20, is now passed through the loop of the double silk suture and drawn back through so that the wire takes the place of the silk sutures, posteriorly and anteriorly. Lead plates, (Fig.5) gauge 18, are then perforated with holes corresponding to the double wire suture, shaped so as to extend from a point about one centimeter posterior to the posterior suture to about one centimeter anterior to the anterior suture on the side of the maxillary process not united with the premaxilla, but should be somewhat longer on this side so that the tension may be brought to bear on the premaxilla. (Fig. 6.)

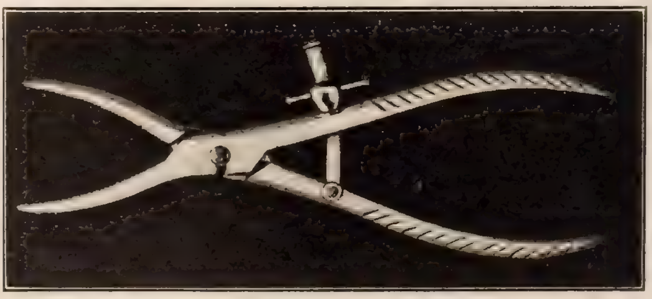

Fig. 7.

The wires are then passed through the holes in the lead plates and twisted together as follows:

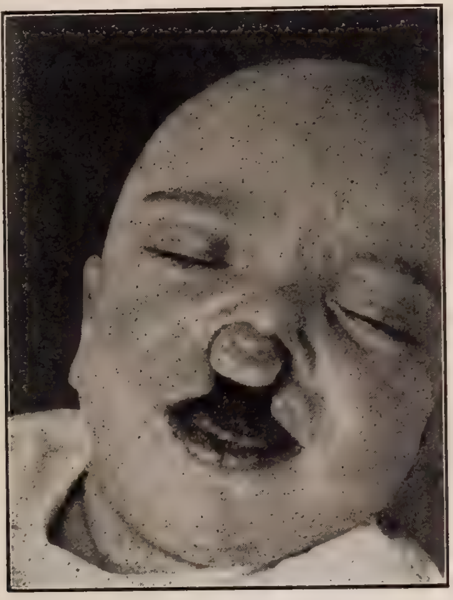

Fig. 8.

After the surfaces of the parts where union is expected to take place have been thoroughly scarified, there being four wires contained in the

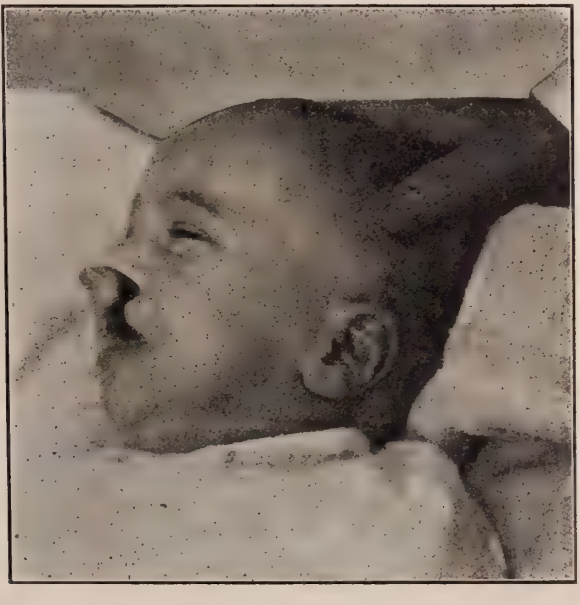

Fig. 9.

two double sutures, the two center wires are twisted together. The end of the posterior wires are brought around over the lead plates to the anterior portion and twisted together. The anterior wires are brought over the anterior portion of the plates and twisted likewise. By exerting great tension on the maxillary process and tightening the wires at the same time the parts can all be brought into apposition and normal relation. If for

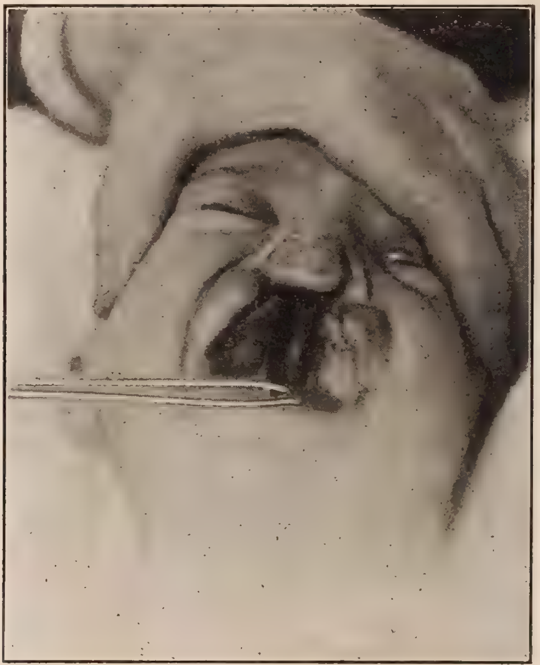

Fig. 10.

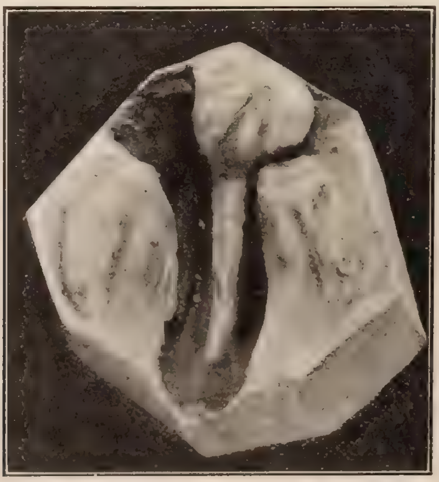

Fig. 11.

reason the operation can not be made until the maxillary processes are too firm to be brought into normal relation by the pressure exerted by the thumb and fingers, at the time of tightening the wires, it may be accomplished by using the Logan clamp in bringing the parts together. (Fig.7.)

One of the worst types of cleft palate to be encountered is the double cleft palate with the protruding premaxilla. (Figs. 8, 9, 10, 11.)

This is a type of deformity that should always be corrected by surgical interference in early infancy. Figs. 12 and 13 show the result when this type of deformity reaches maturity without a surgical operation. This type is always accompanied by double hare lip. The condition of the mouth of children afflicted in this manner makes it extremely difficult for them to take nourishment and great care must be exercised in their feeding that too much air is not taken with the food. The earlier this type of cases is treated after birth, the more successful will be the result.

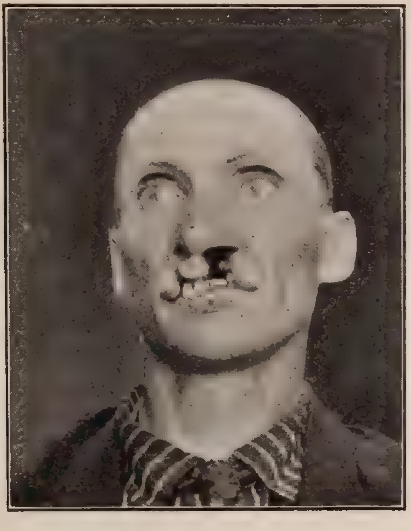

Fig. 12.

The manner of treatment is much the same as the preceding type. cnly that the wire sutures engage the lower portion of the vomer, (Fig. 14) and an oblique incision is made through the vomer, letting the premaxillary process drop back into normal position. The parts where union is expected to take place are thoroughly scarified and the anterior wire of the suture is passed through the anterior portion of the premaxilla and all the wires tightened by twisting the same as in the preceding type. Great pressure is necessarily brought to bear upon the tissues at the time of twisting the wires, that the parts may all be brought into normal relation. These lead plates are usually left on for a period of four weeks before removing and this type of cleft palate is reduced into the type of deformity shown in

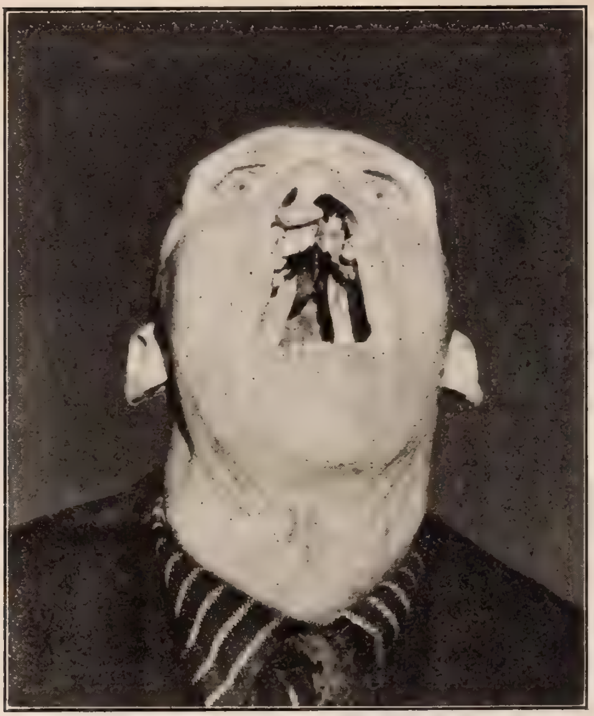

Fig. 13.

Fig. 15, where the soft palate with only a portion of the hard palate is involved. When the child reaches the age of eighteen months the tissues of the soft palate are sufficiently developed so that the second operation of closing the soft palate in indicated.

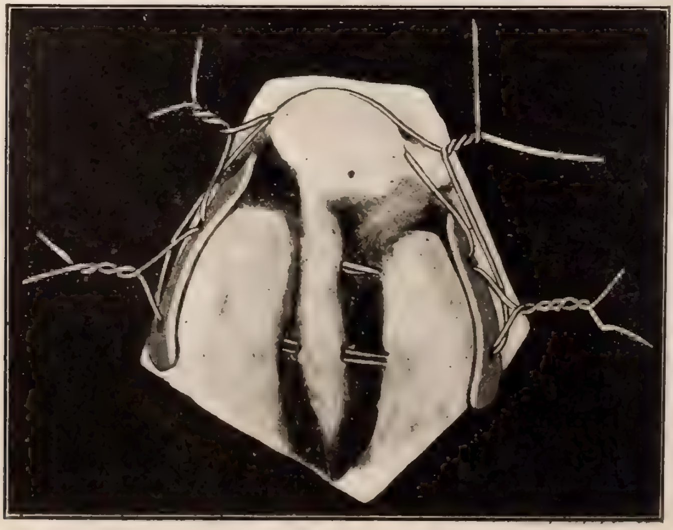

Fig. 14.

These two types with their variations are frequently met with, but on account of their wide variations in the extent of the deformity, the surgical procedure in each case must necessarily vary in character, but the principles involved are practically the same in each case. Some operators attempt to close the anterior portion of the cleft through the hard and soft palate by use of adhesive strips, strapped from one cheek across the cleft to the opposite side. (Fig. 16.) This acts in assisting to bring the parts together, in two ways. First, by causing pressure on the maxillary processes, this pressure being increased by the movement of the muscles of the face, every time the little patient laughs or cries. Second, by forcing the buccinator muscles between the upper and lower jaws, preventing the mandible from forcing the maxillary processes apart. This

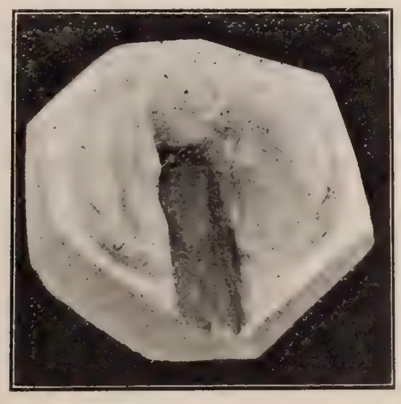

Fig. 15.

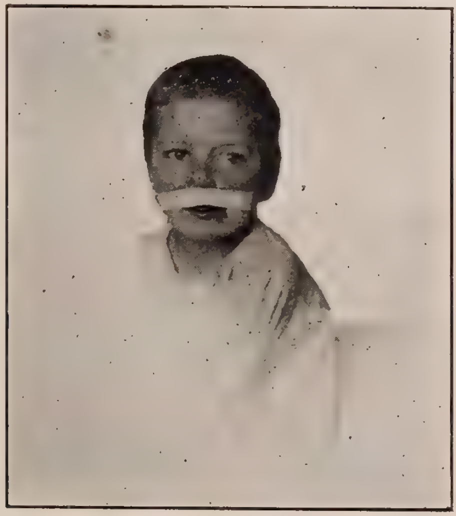

Fig. 16.

method was used quite extensively by the late Professor Nicholas Senn when cases presented that were favorable for this class of treatment.

Clinical experience has proven that this method is effective only when the treatment can be begun right after birth, or before the maxillary processes become so firm that sufficient pressure can not be made in this manner to move the processes together. When this is the case the more radical treatment is indicated.

When the type of the deformity involves only the soft tissue with a portion of the hard palate, (Fig. 17) a different process of surgical treatment is resorted to. This operation can be performed at any age, but preferably at an age before the habits of speech are formed.

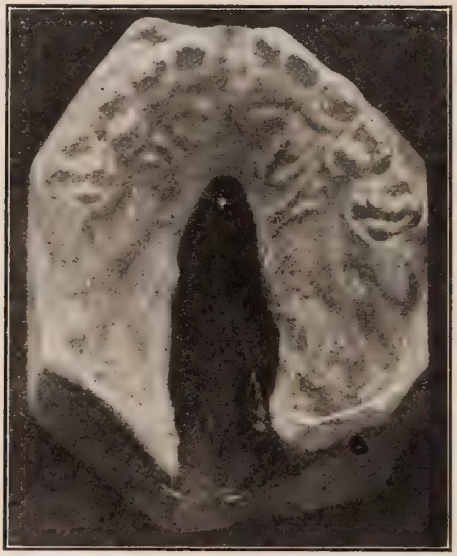

Fig. 17.

This operation is the one used as the final treatment for those cases where the anterior portion of the palate has been closed by a previous operation, and also for those cases where the hard palate is not involved. Many cases are presented of this type, where the extent of the deformity varies from a bifurcation of the Azygos uvulae to a cleft of all of the soft tissues involving in varying extent the bony structure.

The technique of this operation is as follows: The hard palate that is involved in the cleft is denuded of the periosteum by making use of curved periostectomes elevating it sufficiently from the bone to provide for sufficient tissue to bridge it across the cleft. After having denuded the hard palate of the periosteum, the next step is to cut the aponerosis between the hard and soft palate at the distal surface of the horizontal plates of the palate bones. This is accomplished by the means of shears curved at an angle of about 75 degrees. This being done, the soft parts readily fall together, comprising two flaps, one on either side, extending from the Azygos uvula in the posterior to the anterior part of the cleft. The edges of the flaps are now pared or freshened, and double silk sutures, four on either side, are inserted by means of suitably curved needles. These four double silk sutures are drawn through to the opposite side in the same manner as were the sutures in the operation of closing the cleft in the hard palate; so we have four double sutures running through from one side of the cleft to the opposite. With these double sutures, No. 22 silver wire is drawn through, the silver wire substituting the silk sutures. Then lead plates, gauge 22, are perforated with four holes the same distance apart on the plates as the distance between the wires. These plates are long enough to extend from the anterior part of the cleft to the posterior border of the soft palate, and are about one centimeter in width and bent to conform to the shape of the palate. The wires are next passed through the lead plates and twisted together. The posterior wires on either side are twisted together and the two anterior wires are treated likewise, the final tension not being made until after the final coaptation sutures are introduced and tied. (Fig. 18.) Experience has proven horse-hair to be the best suture for this purpose.

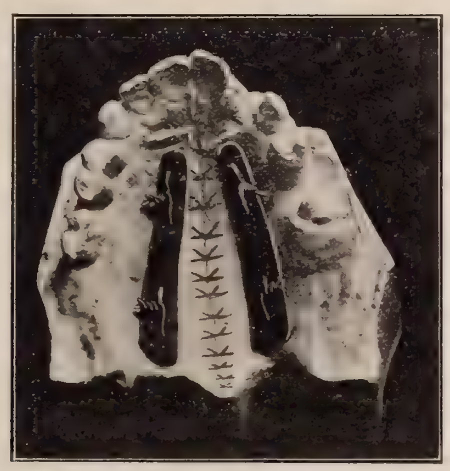

Fig. 18.

The lead plates accomplish a twofold purpose. First, they relieve the tension from the wound, preventing the horse-hair coaptation sutures from cutting out. Second, they act as a splint, rendering the palate inflexible to a great extent while union is taking place. Usually about fourteen days is sufficient time for union to take place, when the lead plates and wire, together with the coaptation suture may be removed. The after-treatment in this operation plays a very important part in its ultimate success. Figs. 19 and 20 show before and after treatment in this type of the deformity.

The progress of the process of healing of this type of cases meets with some peculiar obstacles. Too narrow surfaces have been approximated. These surfaces have a good blood supply, but usually there is little tension at the point of suture, which frequently leads to cutting and slight necrosis at this point. There is also a large surface of tissue above, which has been exposed by separating the periosteum from the bone, a surface exposed to infection with every intake of air through the nostrils. The advantage of breathing air as free as possible from contagion is desirable, a condition not easily attained in the general ward of a hospital. The sur-

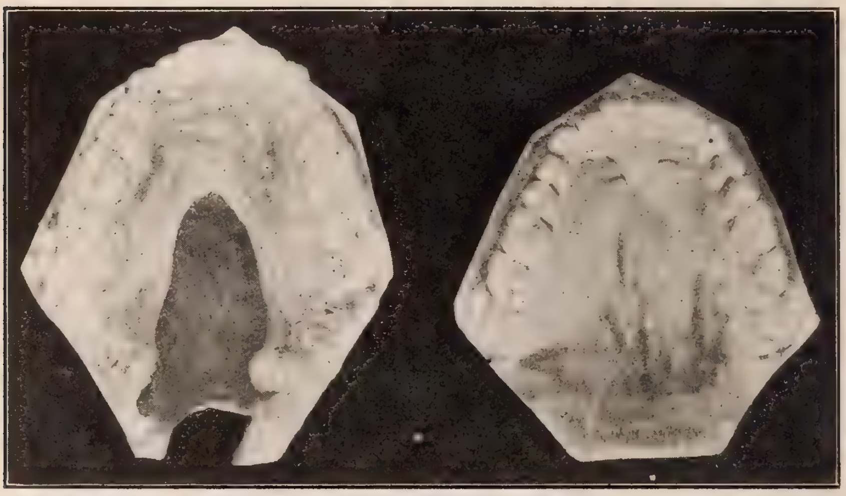

Fig. 19.

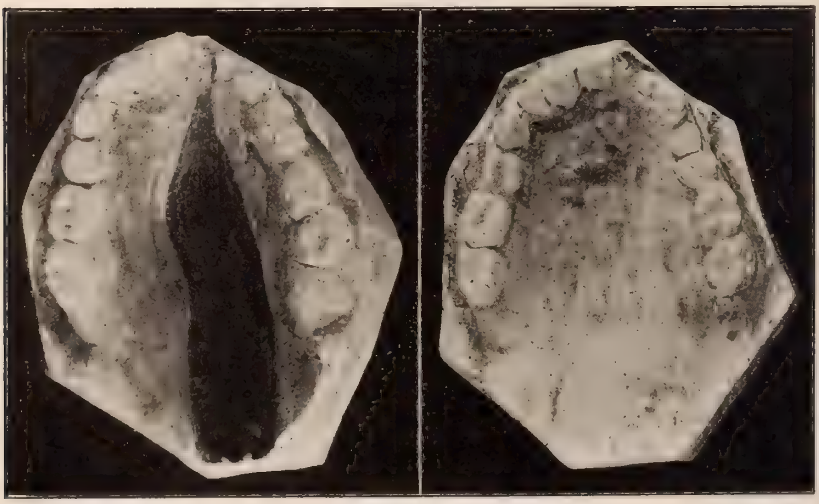

Fig. 20.

face should then be frequently cleansed with a weak peroxide or normal saline solution. The lower surface may be washed in the same way.

Perhaps the greater difficulty in the way of repair is motion. The parts are fixed as well as possible with splints and sutures, yet every time the patient coughs, takes food, sneezes or swallows, there will be more or less motion of the parts. Great care must then be exercised in feeding the patient, if a child, to prevent crying, etc.; in fact, the patient must be under constant surveillance. The arms must be kept straight by splints at the elbows to prevent the child from putting articles in the mouth which might tear the feeble union. The cleansing of the parts is of the utmost importance, as a lack of care in applying tampons may break the union, or the use of the spray may have the same effect by causing the patient to cough or sneeze.

Opiates may be necessary at first to help in obtaining the necessary amount of rest. Local applications are of some advantage in promoting union, providing they are used with caution. The silver preparations are most useful. Argyrol in 20 per cent. solution, applied three or four times daily with a camel's hair brush, not only cleanses but promotes healing by inducing a hyperemia. When the stitches are removed, or if any point seems to give way, touching the edges daily with the nitrate of silver will be found to yield good results.

All applications should be made in such a way that they will not cause the patient to gag, thus putting strain on the feeble tissue. The results of a beautiful operation may be entirely destroyed by neglect or improper nursing.

The feeding is best accomplished by placing the patient on the back, with the head slighty elevated, and allowing the food to trickle into the mouth from a small rubber bulb syringe, commonly known as an ear syringe.

In the removal of the plates and stitches, great care and discretion must be shown, for they may become absolutely harmful. We have been obliged to remove the plates as early as the sixth day because of the damage which they were doing. No operation in surgery needs more careful attention to details in the after-treatment than that for cleft palate, if it is to be successful.

JUST one man in a hundred can see beyond his nose; the short-sighted people are in the majority—and the majority rules. Only imagination can visualize what is to be; most people have no imagination, therefore they doubt and ridicule what they do not comprehend. To them the oak is never apparent in the acorn.—Kaufman.

THE DUTY OF THE DENTAL SURGEON TOWARDS THE CHILD*

By Samuel J. Lewis, D. D. S., Kalamazoo, Mich.

I CALL my subject "The Duty of the Dental Surgeon Towards the Child," not because I wish to enter upon the intricate defects that the dentist finds in the oral construction of the child, but because I conceive that there is a duty that the dentist owes the child in the treatment of it, outside of any surgical or clinical disturbances that may present.

Indeed, that duty is so elemental, that is to say, it presents itself so early in the game, that to my mind the dentist, however skillful a surgeon, cannot begin to treat the child efficiently without first performing that duty.

Now what is that duty? To my mind it is the duty of understanding the child apart from the treatment that the latter may need—a duty so simple and self-evident, and yet wittingly or unwittingly, woefully neglected. Of all the articles that we read in dental journals concerning the treatment of the child, not one, so far as I know, at least, treats of this all-important phase of the subject. In other words, give me the most skillful surgeon and if he is ignorant of the first principles that concern child life, I make bold to say that he cannot give to his child subject the best treatment that his skill would otherwise warrant.

Now, then, the question arises as to how to set out to perform this duty. It can be done only by taking the child as an individual, the child in its concrete form and studying it from a psychological standpoint.

Now, a few words as to what constitutes our duty to the child. I shall not try to take up the matter of filling, extracting or regulating teeth, but rather I shall take up the matter of treating the child as a teacher would his pupil. I shall show you how to reach the child itself, to show it what you have to do, what it is to expect, the evils derived from lack of attention on its part and above all, how to banish the idea that is conveyed to most of them that the dentist is a barbaric sort of a creature and his work is compared to the work of the devil himself.

Plato said: "Are not all actions, the tendency of which is to make life painless and pleasant, honorable and useful?" If this is true isn't it an honorable and useful thing for us to give the child what belongs to him, that is the benefit of our knowledge and teaching—or are we going to remain dormant and treat the child in the haphazard way, just plugging up a hole here and there or extracting a tooth here and there? No, my friends, it is time to wake up out of this long sleep and make use of the scientific investigations which have been afforded us. We are no longer artisans or skilled mechanics, but scientific, professional men. We are teachers and much needed ones.

Heretofore we have all had our troubles in managing the child while in the chair and it is all due to the concepts that the child has obtained, either from the mother or the dentist himself. Just so long as teachers were not able to teach the child just what it needed, so long did they have their troubles in establishing a discipline and making the child love its school work. But by means of psychological study, teachers are now fitted so that they can appeal to the child's innermost self and naturally make it love its work. What is the result? You hear very little complaining on the part of the child as to its detesting school. This was not a matter of a month or two or a year or two, but extended over a period of not less than twenty years, and now through a restatement of pedagogical principles and a modification of home training, the child has passed from the stage of being an enigma into a concrete tangible phenomenon. It is the irony of fate that the child should have been the last of God's own creatures to be studied scientifically. But nevertheless, we are reaping rich harvests.

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*Read before the Southwestern Michigan Dental Society, 1910.

The subject of child study is indeed a difficult one and such a wealth of material is placed at our disposal that it is almost impossible to treat upon it in the capacity of this paper. Therefore, I shall not go into it very deeply, but rather I shall pick out the most essential things as I see them.

As the child passes from the stage of pure instinct, which is somewhere in its third or fourth year, it begins to wonder in a quasi-rational way what the why and wherefore of things are. It soon develops special functions of perception, memory, imagination, conception and judgment. First of all is perception or the act of getting knowledge of individual objects present to the senses. It is the initial stage of apperception, that is, it tells us what things are, while apperception tells us what they mean. The next stage of development is memory or the act of recalling the picture of a past experience. Under memory is developed the power of imagination or the embodiment of the ideal in concrete form. Perception gives us the idea of an object; imagination reverses the process. It creates an idea and expresses it in some individual form. From this develops the power of conception which may be defined as an image which symbolizes the general processes by which all the individual members of the class to which it belongs are constructed. Along with this develops judgment which is the process of discovering and verifying the relation of things. It is the typical act of knowledge.

In earlier life the child seems to apprehend likeness and difference intuitively—that is without any special effort at finding them and it is rather superficial. It is only as it begins to find the less evident that formal judgment is called into requisition. Here is where you find out the difference between the judgment of man and child. A child's judgment is confined to narrow limits and few details, while a man's consists of a knowledge of the essentials and this only comes with experience and education. The basis of all judgments is reasoning, which is the operation of the intellect by which the relation of certain things are found through a medium of others. More definitely speaking, reasoning is simply finding out the relation of two ideas through a medium of the third. Of course, a child may reason at first without any basis for thought or rather superficially as is illustrated by the following:

A child is given bitter medicine in a spoon and it concludes that every medicine offered to it in a spoon is bitter. This is what we experience when a child is brought to us with a pre-conceived notion that the dentist will cause it pain and therefore that it must suffer ill-treatment at the former's hands. The only way to overcome this is to prove to the child that this is not so. As the mind of the child is satisfied with so little evidence it is also easily moved to change its views, particularly if pleasure or advantage appears. In our case, we must show the child where its mistake is and to tell it that you are not going to mistreat it, but rather you are going to make things as pleasant for it as you know how. This can be done by taking the child on your knee, telling it a story or playing with it until its mind is attracted to yours. After deliberating upon this a while, you can start the conversation about some little friend of theirs who came to see you, being afraid at first and now that it just loved to come. By doing this you associate something with their mind, and they soon begin to crave for that thing which afforded so much pleasure to the other child.

A child's mind can be turned so easily that you have to guard against another thing; that is the relation between the parent and child. This relationship is so strong that once they undo a thing for you, it is almost impossible for you to do it over again. The mother must be made to understand that in no way must the child's mind be poisoned against the work of the dentist. In other words, it must be made plain to the mother that the child is not to hear any unpleasant experiences of the elders, but on the other hand, anything pleasant *must* be told them. If in some cases you are to have a child come under your care who has heard these unpleasant things and you are unable to even get it to your office, this plan I found out will work the best of any.

I make it a point to call at the house some off evening for a social chat and in the meanwhile I get real well acquainted with the child. I talk about its school work, its play and compare instances of my life with its own. In this way I get the confidence of the child, really by being a child with it. I then, with very much trepidation, approach the subject of teeth and tell them how nice it is to have a good set of teeth and draw a comparison with some children they know who have either an irregular set of teeth or are troubled all the time with toothache. It will listen to this and then you bring it into the comparison and soon you have everything coming your way and it is yours. I remember one case where a little girl had a dreaded horror of me, because, as I learned afterwards, the mother had told her that unless she went to see me, she would have me come down with a pair of forceps and extract her tooth. Now you see where that child reasoned. In the first place, she had been to some dentist who had hurt her real badly and she formed a conclusion that every dentist must hurt that way, a practical demonstration of what I said under the reasoning power of a child.

I came to the house one evening, of course not knowing what the mother had told the child, and upon entering the child gave a scream and rushed out into the kitchen and began crying. I was surprised and asked the reason and of course I found out what the mother had told her. I followed her out into the kitchen and she cried, "Keep away from me! I don't want you to pull my tooth," whereupon I placed my arm about her and told her that I would give her my word of honor I would not touch her teeth. And I told her to look through my clothes and see if I had any instruments with me. I also told her that I had just come over to spend the evening and that she was to come in and that we were to have a real nice visit, that was all. Gradually, with a little coaxing, I succeeded in getting her into the parlor and switched the subject to the piano which stood in the corner of the room. I asked her whether she played and told her what a fine instrument I thought it to be. I then spoke to her about her school work and about her little friends, all the time getting nearer to her, until I had her seated upon my knee. We talked about everything imaginable and when my chance came, I asked her whether she could make out any reason for her being afraid of me. Of course, she related to me what her mother had told her and I immediately told her that I knew nothing of it and that I had only dropped in to make a social call. This started the conversation and I told her what nice teeth she had and I didn't see why her teeth should be extracted. Of course she told me what she had done and I told her what I had done for little friends of hers and I wanted her to ask these children how we got along together. Well to make a long story short, before an hour was up I had her promise to come up and see me for the purpose of having her teeth cleaned. I explained to her that I would not use the engine at all. Now that little girl is one of the best patients I have. I can do most anything with her without the slightest provocation on her part of any discomfort.

Now, then, to apply the principle—I merely got at that child as an individual. I found out where her weak points were and I made something pleasant out of the unpleasant. I appealed to the innermost senses of that child.

Another obstacle which stands in our way is getting children into the chair after they are brought up to the office. If I think there is any possibility at all of their being afraid, I talk to them in the reception room, always saying pleasant things to them making them laugh and play with me. After I have them going a bit I ask them if they ever had a ride in a chair that went away up in the air and in most cases they are anxious to try it. Once you get them into the chair half of the battle is won and you can usually proceed with an examination. One of the best things I know is to have an orange-wood stick ready and charged with pumice and show them how you clean teeth. If you can show the child that you are going to clean teeth without the aid of instruments you can usually get their consent. One mistake made so often is to have a lot of instruments lying around. The child and even the adult should see no instruments whatever upon entering the operating room: everything must be kept under cover. In this way you can usually clean their teeth and if you don't hurt them you can always, and I do not say this without sufficient cause, get them to come back again for some other work if they happen to have any.

While children are under my care I always tell them in very plain words what their teeth are for and why we are there to take care of them. I also tell them that unless they take care of their teeth they will be bothered with aches and pains like little Johnny Smith or Johnny Jones. This always makes them listen to you. I always show them pictures of children with irregular teeth and tell them that this is the way children look when they neglect their teeth. I also tell them what the teeth are for, why they have them and what they have to do to keep them the way they are at first. I show them the way to brush their teeth and if they have a brush I have them bring it up and go through the process with me. I familiarize them with everything concerning teeth and after all the only way to overcome fear is to establish familiarity. A child is always influenced by a higher culture about them and you are the possessor of that higher culture. I always tell them what I am doing for other children and this will make them ask each other about it. This brings about an association of ideas which helps to develop the reasoning power and judgment of a child. Of course, children will ask you any number of questions and don't hesitate to answer them in some way or other as this is only a phase of curiosity coincident with that of language. Here, then, we are teachers. We help to develop the child along other lines. Naturally, a child will oppose some of the things we do, but it is not because the child wants to. We might say that these children are faulty, but they are not: these faults are merely the inattention of lack of application. The child's attention is passive and it only becomes active as it develops. We must bear in mind that it is impossible to continue one thing too long on a child and it is irrational to expect to continue voluntary exertion on a child for any length of time. A child craves for something to do rather than to have done. To put this into practice we must never allow ourselves to keep the child too long at one sitting. For the average child I use from fifteen minutes to one-half or three-quarters of an hour, or as soon as I see they become restless.

Never lie to a child. Don't tell them that you are not going to hurt them but rather you will try not to hurt them and in all probability you won't hurt them. Always sympathize with them, but don't let it go too far, as you may turn the child's mind with too much sympathy. You must be firm and have them to understand that you are the master. When you examine the child, do not look only for cavities but also for any signs of adenoid tissue, enlarged tonsils, stomatitis, old roots or erupting permanent teeth. In other words, give the child a thorough examination, noticing every little detail and making note of same. In this way you are doing the child a great justice and you will be able to work in closer harmony with the physician and this alone will bring you into closer relationship with him.

You will often hear dentists say, "Well, you can have the children, I don't want to bother with them." Now, isn't this inhuman? Isn't it a breach of humanity on their part? Why under the heavens should they be neglected just because they give us a little more trouble than do some of the adults. When I hear this sort of talk my very blood boils, and I have a stronger feeling for the poor child. Why should they be handled like the very dirt beneath our feet? Woe to the dentist or even the man who does not love children, for as the old saying goes, "He who doth not love children, flowers and music, is not fit to live." Unless you love children you cannot do your duty toward them and each and every one of you owe it to them.

So, you see, we have a great duty to perform besides filling their teeth; we must study them; we must educate them; we must appeal to them; we must conquer them.

DISCUSSION.

Dr. F. K. Ream: I want to congratulate the doctor for his effective discussion of the subject of the child. I shall offer a suggestion regarding "concrete tangible phenomena." I would omit "tangible" and leave concrete phenomena. If the boy has an older marriageable sister, worth $25,000 in her own right, I think that would be an excellent system to take up, taking the child only on the lap.

There is one thing the doctor has omitted and I am sorry for that. He did not refer to the necessity of instructing the parents that when he is spending his time educating this child and fooling around in that way they must pay him just the same as when he is operating. If I have a case of this sort I tell the parents of these obstreperous children that I shall charge just the same as if I were doing work for the child. If I must spend three times the time I should before they consent to be worked on, I charge three times the price. Had I not told them I would have had trouble in collecting the fee.

Another thing is regarding the proper way to extract the tooth. You may accomplish all the things Dr. Lewis has stated but still be absolutely unable to employ anesthesia. Its necessity in extracting six-year molars, opening abscesses and many other conditions is acknowledged. There is no case I hate to see come to my office as bad as an abscess of the six-year molar, with mouths completely closed, accompanied by enormous swelling and trismus. There is one successful method. Have your assistant take the child in her arms and hold firmly. Partly anesthetize the child, then pry the mouth open, put in your gag, complete your anesthesia and extract tooth. I oftentimes have the parent hold child.

Dr. Samuel J. Lewis (closing discussion): I am very much gratified to hear this discussion. It will do me good, as I am very much interested in the study of the child. I started out at the beginning of my practice, and that was not so very many years ago, and naturally came in contact with many children so that I could well afford to make a study of them. I found that I was having altogether too much trouble with the management of them, so I took advantage of the little psychology I had studied; I reinforced it and found that after studying any child thoroughly from this viewpoint I could get at them in a practical way.

As to the suggestion of Dr. Ream about charging my fees, that is all right and I will in the future follow his plans. As to getting paid for the time, I do not say anything about it, but charge it in my regular fee, and I find I have but very little trouble in collecting the fees.

I think that this subject should be taken up more than it is. We have got to get into the matter more deeply. We have been going thoughtlessly about; we have not delved into the matter deep enough, as I have said before. The child is a very important and a very interesting subject to study.

I realized when I wrote my paper that I would not be able to cover this important subject as clearly as I wanted to. This was not my intention; my intention was to give you something to think over; to awaken within you the fact that it is absolutely necessary that we study the child from a psychological standpoint before we can overcome the obstacles which stand in the way of their proper treatment. It is also time to take up the matter of educating the parent as well as the child, but I think for the present the amount of the subject I have covered will suffice. I will be able to give you and the profession at large, more detailed study of the child in the near future.

SILICATE CEMENT*

By A. McAlpin, D. D. S., Warren, Pa.

THE history of so-called silicate or silicious cement has been one of trial and tribulation. When one desirable quality seemed to have been obtained other and fatal defects developed and many a promising candidate has been relegated to oblivion after a more or less encouraging career. The search for a tooth preserver embodying all desirable qualities will probably be continued for a long time yet before the reward of discovery shall have been secured. Still much has been done in the past ten years and mingling with the headstones of defunct representatives may be found some whose ability and integrity are well established.

The demand for a filling material that shall have the qualities of restoring the teeth to their original beauty and natural appearance combined with durability, ease of manipulation and insertion, and freedom from deleterious action on the tissues is universally recognized and would seem to meet most of the requirements and be a boon to the profession.

Failing to meet one filling these requirements in the highest degree, are we justified in using and recommending any that appear to approach them in a marked measure?

Are there any on the market that come in this class? Let us note more particularly what specific qualities are demanded and some of the shortcomings of the materials heretofore used.

Gold, the time honored stopping, while holding high rank as a tooth preservative has the fatal defect of presenting a most unsightly appearance when used where it can be seen in the anterior teeth. Thus it falls short in one of the most essential features. Amalgam and tin are out of the question on account of their appearance. Gutta-percha and the oxyphosphates lack the quality of inconspicuousness and stability. Then there are left practically only porcelain and the so-called silicates that come anywhere near meeting the requirements in respect to appearance. Porcelain probably fills the demand for a material of the natural tooth appearance better than anything yet used, but its use is surrounded by so many difficulties and its capabilities of application in such a comparatively small range of the cavities that we encounter, and the inability of many dentists to compass the technicality of its working, makes its field a relatively small one.

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*Read before the Lake Erie Dental Society, 1910.

This brings us to the consideration of the remaining silicate cement. Briefly, this may be understood to mean a cement possessing a greater or lesser glass-like hardness, natural tooth appearance and translucency, which is to say, transmitting rays of light without being transparent.

Numerous attempts have been made to produce such a material with indifferent success. Some have promised much, but after a brief career and a great expenditure of money by their makers, have been withdrawn from the market and today perhaps there are not more than a bare half dozen that possess in any degree the desired qualities. Some have quickly melted away after insertion in the cavity, while others possessing a required stability have not retained their original color, turning from a light brown to a deep black in some cases. Other bad features have been undue influence on the pulp, resulting in its death, pitting and coarseness of texture, lack of translucency or a natural tooth appearance in the mouth, solubility, inability to withstand the stress of mastication, unduly quick setting, not giving time for its proper manipulation and insertion in the cavity and non-adhesiveness.

Now, the ideal filling material will not possess any of these defects in a marked degree. Are there any that meet these requirements? I think there are. While time alone will determine some of these questions, enough time has elapsed since some have been in use to give at least a reasonable insurance of complying with the demands.

Dr. Ames, of Chicago, who, by the way, is perhaps as competent authority on cements as any in this country, says "this generation will probably not see all limitations of silicate cements removed," and the making of a serviceable alloy is a "summer picnic compared with the solution of the cement problem."

Numerous attempts have been made by American manufacturers, but so far the Germans appear to lead in this direction. The oxy-phosphates, which in many ways approach the hardness and durability, lack the translucency necessary to restore broken down tooth tissues to the original form and appearance. For while many materials, gold for example, give the form without natural tooth appearance, they are fatally defective in visible cavities.

What satisfaction is it to the dentist to perform a laborious operation with gold, leaving the patient a shining monstrosity in appearance?

While we may in some ways deplore the possible departure from the high standard of skill required to do difficult dental work with gold, the welfare of our patients requires that we consider all phases of the proposition and so far as the greatest good to the greatest number is concerned, there is no question of the place of silicate cements having established their right to exist. Let us consider somewhat their practical application.

The cautious operator will use it mostly in approximal cavities and labial and buccal cavities in teeth exposed to view with no part of the filling subject to the stress of mastication. In such situations it may be said to be almost ideal; owing to the considerable adhesiveness of some it may be used in shallow cavities of little natural retentive form.

The more venturesome operator will restore broken down corners and even go to the extreme procedure, on occasion, of building up entire crowns, though porcelain may be used to advantage in such cases.

The writer has, however, as an experiment and to determine the possibilities, made entire crowns which have withstood the stress of mastication upwards of three years and has had under observation contour fillings which have maintained a respectable outline and been safe preservatives for more than five years.

These practical examples perhaps possess more value in determining what may be expected from silicate cement as a filling material than all the extravagant, unproven claims of several manufacturers, whose advertisements may be seen in the dental magazines.

What we *know has* happened is of more account than the statement or prediction of any man as to what will or may happen. There have been many excellent articles published regarding cavity preparation and the technique of manipulation and that phase will not be considered to any extent in this paper.

One of the most comprehensive, rational, tactful contributions in this line is a paper read by Dr. Ames before the Michigan State Dental Society and published in The Dental Summary for November, 1909.

Briefly regarding the practical use of silicate cement:

If one wishes to take the minimum chance for unsuccessful results, he will use the cement only in cavities located on the approximal or labial or buccal surfaces unexposed to the stress of mastication, having margins that may be made at right angles, avoiding anything approaching a feather edge in the filling. Such fillings may be expected to fail only from chemical dissolution or from abrasion from the tooth brush. This I believe to be a negligible factor and such fillings may be counted on to render satisfactory service for years. Even admitting the possibility of having to renew them occasionally, I would advocate their use as they always present an æsthetic effect, while gold never does, and their comparative ease of insertion renders their renewal a simple matter. There is a large class of cavities calling for a becoming non-conspicuous filling material in which its use may be recommended with some caution. Among these may be included the restoration of broken down corners of incisors, cuspids and compound approximal cavities in bicuspids and molars when the contours can be made with a considerable mass of material. The writer believes from the experience he has had that it can be used with eminent satisfaction, doing away with unsightly amalgam in many cases. It may also be used as a veneer, covering the exposed surfaces only of amalgam and even gold fillings and inlays, giving the established strength of these old well known materials with the pleasing effect of the cement. When retention is difficult from the form of the cavity it may be obtained by the use of anchor screws. In fact, in extreme cases an operation may be done by their use easily and with certainty of results, undercuts and a sacrifice of tooth tissue avoided and a maximum degree of support acquired with a minimum amount of labor, danger of encroachment on the pulp, breaking down of the tooth and discomfort to the patient. It will hardly be necessary to say that non-metallic instruments would better be used in its manipulation.

The writer, after considerable experimenting, believes an agate spatula and slab to be the best for mixing. For inserting in the cavity he uses suitably shaped instruments made of horn. Bone, ivory, agate, tortoise-shell, wood, hard rubber, have all been used. These have to be too large and thick to give strength or if made thin are too fragile. Horn is tough and strong and can be made almost as light as a steel instrument. Of course, the material should be kept free from moisture during the insertion and for a considerable time thereafter, this by use of the rubber dam and a coating of a suitable varnish after the filling shall have been completed, a thin solution of Canada balsam in chloroform makes an impervious adherent coating, sometimes being found clinging to the tooth after a lapse of several days.

Then to summarize briefly, in closing, the writer believes that no dentist who has regard for the welfare and good appearance, not to say happiness of his patients, or who considers a beautiful set of teeth filled with practically invisible silicate cement more desirable than one marred by conspicuous unsightly gold blemishes or abhorrent, intolerable gold crowns, can ignore the claims of the newer silicates or consistently conduct a practice without them.

DISCUSSION.

Dr. J. A. Boarts, Greensburg, Pa.: My experience with silicate cements has been limited to two different makes, and it has convinced me that it should not be classed among the permanent filling materials. A large percentage of fillings put in with careful attention to detail and manipulation fail in a couple of years or less. The failures are apparent in faulty margins, granular surfaces, discolored fillings and shrinkage. These factors, to my mind, clearly put the silicate cements out of the list of permanent filling materials. I do not mean by this that the silicate cements should have no place in the dental practice. I believe, on the contrary, that they have a very definite field of usefulness as temporary filling materials, to be used where esthetic requirements are to be considered. The translucency of these silicates makes it possible to use them as higher grade cements, to carry along teeth which would otherwise need to be devitalized if a metal filling were to be used.

In hunting corroboration of these views I find that in a recent issue of The Summary the replies received from a number of representative operators confirmed in substance the above stated opinions.

I would like to read from a copy of the program of the Illinois State Dental Society meeting, which is being held this week, a synopsis of a paper which is being read by Dr. Geo. C. Poundstone. Dr. Poundstone is probably the man who has done more work with the silicate cements than any other man, and his opinions are considered authoritative by most men throughout the middle west.

SYNOPSIS

The utter failure of many of the at first beautiful fillings of artificial enamel has changed the enthusiast into the conservative and ultra conservative. With most careful attention to detail in manipulation, a large percentage of enamel fillings fail within three or four years, which places enamel filling among the temporary filling materials rather than among the permanent ones. The failures are apparent in faulty margins, granular surfaces, discolored fillings, discolored margins and shrinkage.

Artificial enamel is evidently a definite chemical compound, setting under definite conditions, regarding temperature and humidity of atmosphere, and while we might accurately weigh the amounts of liquid and powder, the temperature and humidity are difficult to control in the average dental office. The perfect filling of this type has not yet arrived, and until it does it seems unwise for dentists to use to excess a material that will stand in the average mouth no longer than that which we now have.

GOLD AS A FILLING MATERIAL*

By J. V. Conzett, D. D. S., Dubuque, Iowa

GOLD has always held the highest place in the regard of the best operative dentists, and it still maintains that proud distinction. The gold inlay has come, and has come to stay, and has a very large place in the saving of teeth, but it has not, and will never, entirely displace the foil in regard to those men who know how to use it. A good gold filling is as good a tooth saver as it is possible for us to find, it has demonstrated its usefulness through generations of men, and when properly placed has never failed the man who has placed his confidence in it. But while all of this is true it is also true that there is no poorer filling than a poor gold filling, for if it is not properly placed and does not perfectly seal the cavity, it is an immediate failure, for the fluids of the mouth penetrate between the filling and the tooth and the process of recurrence of decay immediately begins. The decay may not become apparent for some time, but as soon as the fluids of the mouth penetrate the space between filling and tooth, the process begins and though it may be slow, it will continue until the decay manifests itself and the filling will have to be remade. It must be confessed that gold foil is not an easy material to use successfully, and the number of men that are adepts in its use is comparatively small. I said that it is a difficult material to use, and so it is, and yet to the man that has mastered the technique of its use it is a most obedient servant and easily and beautifully adapts itself to the master's will. It is only a hard material to use to that man who has not spent the time and energy necessary to master the technique demanded, in order to successfully adapt it to the purpose of saving teeth.

There are certain fundamental rules that are necessary to be observed in order to perfectly fill teeth with gold, and many of these rules are as applicable to any other filling as they are to gold foil, but as we are to consider the filling of teeth with gold foil we will ignore every other material at this time and devote the few minutes that we have at our disposal, to the consideration of the subject in hand.

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*Read before the Northern Ohio Dental Society, 1910.

There must be first a proper cavity preparation, and this consists in the observation of four general principles:

1. Obtain the outline form,
2. Obtain the resistance form,
3. Obtain the retention form, and
4. Obtain the convenience form.

The outline form comprehends the extension for prevention and the esthetic form. The doctrine of extension for prevention is so well known now that it does not seem necessary to spend much time upon it, suffice it to say that extension for prevention means the extending of the margins of all cavities into the territory of relative immunity to decay. These margins are those that are so situated that the food in its excursions over the teeth in mastication will keep clean. These margins, to be so placed, will be carried sufficiently far out of the embrasures in proximal cavities that they will not come in contact with the proximating tooth or of the filling placed in that tooth, but will be so far out of the embrasure that it can be easily and perfectly kept clean. The gingival margin will be carried far enough gingivally that it will be covered by the free margin of the gum, for Dr. Black has demonstrated that decay will not take place under healthy gum tissue. Occlusally the margins will be placed in smooth territory, that is, all fissures will be cut out to their entire extent and the margin of the cavity will then be laid in the smooth tissue immediately beyond the fissure.

The esthetic form is that form that will most perfectly conserve the beauty of the tooth. It is our duty, and should be our pleasure, to make our restorations as inconspicuous as possible, and when this is impossible, as it is in far too many of the cases that we are called upon to fill, it is our duty to make the restoration as harmonious as possible. Gold, while not a perfect filling material in the respect of color, is not inharmonious in its color, and if the lines of beauty are properly observed, does not make an ugly restoration of tooth tissue. The tooth should in all cases be built out to its original contour, for as Dr Black has pointed out, a tooth filled with a material that would perfectly match in color and luster and that did not restore the shape of the tooth, would be far more noticeable, and would be less esthetic than a filling made with gold that did perfectly restore the shape of the tooth. Then, all lines that come within the range of vision should be curved, and never angular.

The resistance form is that form that will give the finished filling the power to resist the forces that will be brought to bear upon it. The principles of mechanics teach us that the best form for a foundation is the flat form, for in any other form there are elements of weakness that will in time tend to destroy the integrity of the foundation; for instance, if the filling were placed upon a round foundation the forces of mastication that were continually being placed upon it would, in time, cause the filling to rock upon its round foundation, and the moment it did that it would cause a leak that would mean the ultimate destruction of the entire filling. So the rule for the resistance form is: Obtain flat seats and parallel walls, approaching as nearly as possible the box form. The resistance form must have depth as well, and the amount of this dimension is to be obtained by a study of the conditions that are present in the case under consideration. If the occlusion is strong the cavity will have to be made correspondingly deep and wide but if there is little or no occlusion, obviously, the depth and width of the cavity will not need to be so great. A careful study of the occlusion should always precede the filling of any tooth and should be one of the first things observed when a study of the case is attempted, for if it is not done and the filling is made in a haphazard way without a knowledge of the forces that are to be brought to bear upon the finished filling, the probabilities are that the filling will fail.

The retention form is that form that is given to a cavity that will tend to retain the filling in the cavity in spite of the forces that may be brought to bear upon it, and that would tend to displace it. The resistance form partially forms the retentive form for it resists all attempts to dislodge the filling that are in the form of thrusts, but it would not resist the pulling forces or those forces that would tend to pull the filling out of the cavity. In the past retention was obtained by the making of pits and grooves, all of which is considered bad form in the present state of our knowledge. Pits and grooves are rather a source of weakness than strength, inasmuch as they have a tendency to weaken the tooth and are difficult to perfectly fill. The general form of the cavity may be retentive but it is not necessary to have any undercuts at all, for if the cavity has flat seats and the walls are perfectly parallel, the filling will never be displaced if it is properly condensed.

The writer has on several occasions demonstrated the fact that the preparation of a cavity for a filling and an inlay was identical. A cavity was made with flat seats and parallel walls in a molar tooth, and then a wax model made to show that it could be easily withdrawn, and then without further preparation a gold filling was made in the same cavity. Care must be taken, however, to have the cavity seats perfectly flat and the walls perfectly parallel, or a failure will result. There is no objection in having the shape of the cavity generally retentive; in fact it is better so, especially for the beginner in this form of preparation. Neither is it objectionable to make a slight convenience point to enable the operator to better start his filling; but this point should never be allowed to degenerate into a pit.

The convenience form is the form that is given to a cavity that enables the operator to perfectly and easily reach all points of the cavity. This is of the utmost importance in the filling of teeth with gold, as it is impossible to perfectly adapt gold to a cavity wall that cannot be reached with the plugger point. In other words it is not possible to condense gold around a corner. The method of cavity preparation that contemplates flat seats and parallel walls is usually all that is necessary in the direction of the preparation for convenience, but in any case that such preparation does not enable the operator to reach every point of the cavity with his plugger point, the cavity should be boldly extended until he is enabled to do so. For if he does not he will not be able to perfectly adapt his gold to this particular spot and a vulnerable point will be left in his otherwise perfect filling, which will in time make for failure. What shall it profit a man to save a millimeter of enamel and lose the whole tooth? The preparation of the cavity is not complete without a very careful finishing of the cavo-surface angle for this is the angle that must resist all of the forces that make for the recurrence of decay. In order to perfectly form the cavo-surface angle we must have a very intimate knowledge of the structure and direction of the enamel rods. It is impossible in a paper of the length that this must of necessity be, to go into the histological structure of the enamel, so I will simply refer you to the splendid work of Dr. Fred B. Noyes in the *American Text Book of Operative Dentistry,* a careful reading of which will give you more information on the subject than I could possibly do in the time allotted to me on this occasion. Suffice it to say that the enamel rods in a general way follow the curve of the dentine and are set on end on its surface. In order to have strong margins these rods must be protected, for if any short rods are left unprotected by the filling material they will fall out and leave a vulnerable spot that will become the seat of a recurrent decay. The enamel walls then should all be beveled all around the surface of the cavity. To do this special instruments have been devised by Dr. Black and others which may be obtained at any supply house; the bevel should be of the depth of about a quarter of the depth of the enamel, so that the gold when built over it will have sufficient body to resist the forces that may be brought to bear upon it without flowing or scaling off.

In filling teeth with gold there are two forms that are used, the cohesive and the non-cohesive. The non-cohesive gold is one of the best substances that a dentist ever used for the preservation of tooth substance from the ravages of decay. It was the gold that the older practitioners used entirely, for they knew nothing of cohesive gold. With this form of gold and without the help of the rubber dam, they accomplished wonders in tooth preservation, but they could not build out contours, and so upon the advent of cohesive gold in their delight with the new, they forgot the good of the old and its use was gradually forgotten. We are now reawakening to its advantages, and, using it in conjunction with the cohesive gold, we are able to do better and more rapid work than we have ever been able to do in the past. In occlusal cavities in molars and bicuspids, in the gingival third of cavities in the proximo-occlusal surfaces of bicuspids and molars and to some extent in the deep cavities which sometimes occur in the bucco-gingival third of molars and bicuspids the non-cohesive gold is unsurpassed in its excellence. The gold is rolled into ribbons and then rolled into cylinders upon a Swiss broach. In this form it is introduced into the cavity with the ends of the cylinders protruding out of the cavity and the sides of the cylinder placed against the sides of the cavity. This rule must be very carefully observed, for a failure to do so would cause a failure by reason of the fact that the gold, being non-cohesive, the layers of foil do not adhere the one to the other and if the portion of the cylinder that was exposed was the side, the layers of the cylinder would peel off and ultimately come out entirely, whereas, if the end of the cylinder protrudes the sides are protected by being condensed within the cavity and cannot possibly come out.

In filling a cavity in the occlusal surface of any of the posterior teeth, the cylinders are selected of a length that will a little more than reach from the bottom to the top of the cavity, thereby leaving a portion of the cylinder sticking out of the cavity. These cylinders are placed on end around the entire surface of the cavity wedging them against the cavity walls as the filling progresses. After the cylinders have been placed all around the walls of the cavity and wedged to place there will be left a small space in the center that remains to be filled. Into this space it was the custom of the older men to introduce another wedge of non-cohesive gold and then mallet the whole into place. There is no criticism to be made upon that method but it is a difficult procedure and a more easy and certain method is to fill this central pit with cohesive gold and then thoroughly mallet the whole filling to place. This makes a filling that is perfect in its adaptation to the walls of the cavity and can be made in a very short time; indeed, it can be inserted so quickly that the dam can be dispensed with if it is necessary for any cause.

The gingival margin of bicuspids and molars is the most vulnerable point of the filling, if we are to judge by the number of failures that we see in gold fillings that fail at this point. But with the use of the non-cohesive foil all of the difficulty and uncertainty of the past, in regard to the perfect filling of the margin, is done away. As a rule, three cylinders of the proper size to bring the filling up to near the step in the occlusal surface of the cavity, are used. One cylinder is placed in the bucco-gingival angle, one in the linguo-gingival angle and then another cylinder is crowded in between these two and the three cylinders carefully wedged to place, after which they are malleted, care being taken that the force of condensation is toward the axial wall, and not away from it, for if it is, the tendency will be to drive the cylinders out of the cavity. The lateral condensation is not attempted until the filling is finished; that is until all of the gold has been placed, when the non-cohesive gold is driven into the cavity with long foot pluggers that will reach into the interproximal space.

Some of the smaller cavities, notably those occurring in the pits in the lingual surfaces of the incisors and the buccal pits of molars, may be filled by the use of but one cylinder. In that case the cylinder is rolled out into a cone shape and the small end of the cone introduced into the cavity and then the whole cylinder forced to follow the point when the whole is thoroughly malleted to place. This is a very easy and expeditious way to fill these cavities and has the merit of permanency.

Cohesive foil, while an absolute necessity in contour work, is not as easily adapted to the walls of the cavity as the non-cohesive and unless great care is taken to perfectly adapt it the filling made with it will soon fail. It will be impossible to go into the entire technique of the manipulation of gold in a paper of this character, so I will confine myself to the expression of some of the fundamental principles that govern the placing of cohesive foil.

First: The line of force must always be toward the cavity walls and never away from them. That is, when a pellet of gold has been placed, the condensation of that pellet must begin at the point nearest to the center of the cavity, and then the plugger point should travel over the pellet until it is condensed against the wall of the cavity, and then if any further condensation of that pellet is to be made the plugger point should be lifted up, carried to the center again and the process of traveling toward the wall again repeated. Never mallet gold in a direction away from the walls of the cavity, for if you do you will draw the gold away from the margin, and as gold is tempered by being malleted, you will not be able to force the tempered gold back to a perfect adaptation to the walls of the cavity, and the result will be a leak at this point.

Second: In malleting gold the plugger should always travel over the surface of the gold in an orderly sequence of steps. That is, the plugger point should be lifted after each double blow of the mallet and placed about 3-4 of the diameter of the plugger point in advance, so that each blow of the mallet condenses the gold under the point and the next blow shingles, as it were, the next piece onto the former piece of gold.

Third: Sufficient mallet force must be used on each piece to give the finished filling a specific gravity of at least 15. For it has been demonstrated that a filling of less than 14 specific gravity will not be impermeable to moisture, by reason of the fact that there is so great a percentage of air spaces in the filling that it absorbs moisture to so great an extent that in time the filling will lose its coherence and will dinintegrate. Not only that but the absorption of moisture will be accompanied with micro organisms, and a recurrence of decay will result. After an exhaustive series of experiments with the various kinds of mallets it has been demonstrated to our satisfaction that the hand mallet in the hands of a trained assistant produces the best results, therefore it has been universally adopted by the disciples of Dr. Black.

Fourth: The plugger that is used to condense the gold must not be too large, for the force that must be exerted upon the plugger is directly proportional to the square of the diameter of the plugger point; therefore if a point of too large a condensing area is used the force that would be necessary to condense the gold would require a blow that could not be borne by the patient. The plugger should not have an area greater than a millimeter square, and better results will be obtained by most men with a plugger of smaller area. Dr. Black says that we are limited to pluggers of a size from .5 to 1 millimeter in diameter.

The annealing of the foil is of the utmost importance and should be carefully carried out. Many operators use the open flame and get good results, but it is a practice that is fraught with danger as if the flame is not perfectly pure there is danger of the deposition of gaseous elements upon the surface of the gold that will make it permanently non-cohesive and the result will be a filling that will scale and flake if it does not break off entirely. The best method of annealing is by the use of a good electric annealer, but good results can be obtained by the use of an annealer that has a flame protected from the surface of the gold by a piece of mica or platinum. In using any of these annealers care must be taken to see that the annealer is hot enough to thoroughly dissipate the gas with which the surface of the gold is protected.

The finishing of a filling is as important as any other part of the operation, and many an otherwise good filling has been spoiled in the finishing. This part of the operation by the old methods has been one that has been tedious and painful to patient and operator alike, but by the methods taught by Dr. Black the operation of finishing a filling becomes a pleasure, because it is so quickly and perfectly accomplished. After the gold has been perfectly condensed in a cavity in the proximo-occlusal surface of a bicuspid or molar, for instance, the black saw is inserted in the interproximal space with its edge toward the occlusal surface and the gold is then sawed out from the proximal surface down to, but never past, the contact point. The Black saw is a strong saw frame that is made to fit a Kaeber saw, then these saws are cut from the back by means of a carborundum stone until they are almost as fine as a hair. This is done to facilitate the passage of the saw into and through the proximal space. The saw is inserted into the space at the gingival margin without its being in the frame and when in place the frame is attached and the sawing made possible. Next the filling is trimmed to its proper contour by the use of the Black knives and trimmers, which are file-like instruments especially adapted to the purpose. The occlusal aspect is ground to form with the usual plug, finishing burs and stones and the whole filling disked and polished with the sand paper disks and strips provided for the purpose. The contact point, which is one of, if not the most important parts of the filling is left to the last. All of the operation of finishing the filling must have the ultimate finishing of the contact in mind, however, for if not, the point will not be properly brought out. The contact must be a point indeed, in all that that means, and a point does not mean an area. A point, we are told, has no dimensions, and that is the kind of a contact that we want. It shoud be, to again quote Dr. Black, as if two marbles were knuckled together. All of the lines of the filling should slope toward the contact and then the contact should be made to knuckle against a similar point on the proximating tooth, and the ideal will have been accomplished. The finished filling should be polished to a mirror like surface by the use of pumice and rubber disk, followed by a little dry tooth powder on a similar rubber disk.

The attempt to describe the methods of filling teeth with gold in a paper of limited length is a work that is almost impossible to accomplish intelligently, and I only wish that I might have the opportunity to talk with my hands instead of with my mouth and I could show you more quickly and more perfectly the reason why every man that learns Dr. Black's methods becomes an enthusiastic advocate of the filling of teeth with gold foil.

(Discussion will appear in July Summary)

THE RELATION OF ADENOIDS TO DEFORMITIES OF THE DENTAL ARCH*

By J. W. Price, M. D., Memphis, Tenn.

POSSIBLY the majority of the malocclusions of the teeth for which the dentist is consulted are due to mouth breathing during the formative period of the facial bones, and of the several causes of mouth breathing adenoids are certainly the most prominent. This question of adenoids has of late been given much attention by the public press and the average layman is today better informed on this subject than was the average doctor of not so many years ago. Ancient art depicts the characteristic adenoids face and Hippocrates describes the clinical picture peculiar to this affection, proving that this is not a disease of recent times, although their existence has been known to us only about a half-century and it is only within the last decade or two that this knowledge has become generally diffused and the far-reaching and baneful influences of their existence fully appreciated.

Adenoid tissue is normally present in many parts of the body, but it is only that collection forming the third, or pharyngeal, tonsil and situated in the vault of the pharynx, with which we are at present concerned. This body of adenoid tissue in its normal state offers no obstruction to respiration, but when it becomes abnormally enlarged, being then termed adenoids, it does obstruct normal nasal respiration to an extent proportionate to this enlargement, with the attendant catarrhal affections of the upper respiratory tract and involvement of the middle ear. This hyperplasia may be so slight that it produces no symptoms, or it may be sufficiently great to completely fill the vault of the pharynx and, in some cases, extend down the posterior pharyngeal wall, so that the adenoids may be seen with the rhinoscopic mirror, or even on simple inspection of the throat if dependent below the free edge of the soft palate. Just what are the causes of this enlargement we are not sure, but irritants of the upper respiratory tract, as colds and the acute infectious diseases of childhood, are certainly provocative of it, and it is probable that the artificial environments surrounding the child of the present day render it more susceptible and increase the numbers of adenoid cases. Children have been born with adenoids and they have been found in the aged, but it is between the ages of 3 and 12 that the great majority of cases occur and derive their chief dangers from obstruction of the nasopharynx, preventing normal respiration; obstruction of the Eustachian tubes, producing inflammatory disturbances in the ear, serve as avenues of infection for bacteria, increasing the susceptibility to colds and the acute infectious diseases of childhood; and, through interference with the circulation and aeration of the blood, retard the child's development and induce a state of mental stupidity and listlessness that, combined with the open mouth and deformed dental arch, presents a characteristic picture of this condition that is recognizable across the street by those who have become familiar with it.

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*Read before the Tennessee State Dental Association.

The chief interest of the dentist in adenoids attaches to the interference with normal nasal respiration and the attendant enforced mouth-breathing, which is the causative factor in the production of a very large number of malocclusions of the teeth and consequent facial deformities.

In the formation of the dental arch the maintenance of a well balanced pressure by the tongue from within and by the lips and buccal muscles from without gives a normally developed arch, with ample room for the eruption of all the teeth, of the proper shape and size to perfectly harmonize with the other structures of the face and, with the full exercise and development of all the muscles and a normal development of the bony framework, we have a face balance in all its proportions and perfect in its symmetry. If, however, nasal respiration be interfered with early in life when all these structures are plastic and undeveloped, if the child then be forced to keep the mouth open to admit the life-giving air, this whole scheme of Nature is perverted and can produce only abnormality of development, the horrible aspects of which are painfully familiar to the dentist and the rhinologist. With the dropping of the lower jaw the normal outward pressure of the tongue on the upper dental arch is lost, and the pulling of the jaw on the structures supporting it exaggerates the pressure inward against the outer side of this arch, flattens its sides, increases the height of its curvature and forces a protrusion forward, which is still further augmented by the teeth not having sufficient room in an arch so distorted and are crowded forward, forcing a protrusion or overlapping of the incisors. This, then, being the cause and the effect, with what remedial measure is this condition to be met?

The ever widening scope of dentistry and its rapid progress in the prevention of disease is making it more and more one of the specialties in medicine, and in preventive dentistry, as in preventive medicine, progress has been remarkable, and it is in this progress toward the highest development attainable that we feel our keenest pride, for the science of prevention is greater than the art of healing and equally as remunerative in its rewards.

Our hope for these cases is in the making of an early diagnosis and the radical removal of the enlargement so that normal nasal respiration may be re-established before the pernicious effects of mouth breathing have perverted the normal development of the denture, with its attendant malocclusion and facial deformity. It was formerly the advice of some medical men to let the child "outgrow" adenoids, and it is quite true that this hypertrophied tissue does undergo atrophic changes and sooner or later disappears, but the damage has been done and the irregular teeth, the abnormal respiration with its attendant train of catarrhal affections and deaf and discharging ears, all condemn the folly of such advice and speak urgently for early interference in all such cases. For those unfortunates who have been left to "outgrow" adenoids I leave it to the orthodontists to say in how far the deformity may be corrected and how well the teeth may be brought into normal occlusion. Their malocclusion is certainly a potent factor in the production of digestive disturbances, for with the function of mastication disturbed and the first stage of digestion impaired, the later digestive processes are working under unfavorable conditions and may not be able to overcome the handicap thus imposed upon them, for in the function of mastication none but the best is good enough.

As the dentist is frequently the first one to be consulted in these cases it is important that he become adept in the recognition of this condition. the gradations of which may vary from a very slight enlargement of the pharyngeal tonsil, causing mouth breathing for a part of the time only, to a complete blocking of the naso-pharyngeal space, effectually excluding the passage of all air through its natural channel. The typical picture of adenoids presents a high arched palate, irregularities of the teeth, an open mouth and a dull and listless expression. Sooner or later the hearing is affected and may be attended with earache or discharging ears which may eventuate in mastoid disease and death from meningitis. These children are very susceptible to colds from the fact that respiration is performed through the mouth, which is not a part of the respiratory tract, instead of through the nose, whose function it is to warm, moisten and filter the inspired air and prepare it for the more delicate structures below. Defects in the function of respiration are productive of many other symptoms observed in adenoids, the deficient oxygenation of the blood gives the skin a pasty, lifeless color, "nervousness" is not infrequent, the moral sensibilities are obtunded and the mental processes are dulled. When the nose ceases to perform its functions its development is retarded and is found to be shorter and thicker and the nostrils smaller than in normal development. The only positive diagnosis of adenoids, however, except in those not frequent cases where the enlargement can be seen, is to feel the adenoids. This is done by passing the index finger through the mouth, behind the palate and well up to the vault of the pharynx, taking proper precaution to keep the finger from being bitten by the patient. This procedure draws blood and is almost as terrifying to many patients as an operation, and as the symptoms enumerated before are so characteristic and point with such certainty to the existence of adenoids, a positive diagnosis is usually deferred until the child is anesthetized and ready for operation.

The only treatment of adenoids worthy of consideration is the radical removal of all the diseased tissue and, for the reasons given, the earlier this is done the better. So uniformly successful is this operation that a doctor said to me recently, on seeing an adenoid curette lying on the table, that that instrument probably did more good to humanity than any other one instrument in surgery, and the laity, having become acquainted with the far-reaching effects of this enlargement and the ease with which its consequent dangers and deformities may be prevented, not only consent readily to the operation, but are anxious to have it performed. Formerly it took quite a bit of explanation, argument, delay and insistence to gain the consent of parents to an operation, but now it happens not infrequently that after examination of a child a diagnosis of adenoids is announced, the parent will ask at once "When will you operate?"

DENTAL LAWS.*

By Alfonso Irwin, D. D. S., Camden, N. J.

(Continued from page 268 May Summary.)

THE TYPICAL DENTAL LAW

THERE are twenty-eight salient points for consideration in formulating a *Typical* State Dental Law. The incorporation of a preamble is essential as an introduction. It may be worded somewhat like the following:

PREAMBLE

An act to provide for the examination, regulation, licensing, and registration of dentists and for insuring the better education of persons engaged in the active practice of dentistry in the State of Michigan, providing penalties for the violation thereof and to repeal any previous Act in force (including House enrolled Act No. 458, in effect June 28, 1907.)

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*Read before the Michigan State Dental Society, 1910.

VALIDITY

The law must be constitutional. It must conform to the judicial system of the state. It must stand the *Tests* of the courts. Your *best* state lawyers are the men to consult upon the validity of the law. The verdicts of your courts in the past should be your *Guide* upon disputed questions in the *Future*.

ADAPTATION

The *Ideal* law must be adapted to the needs, wealth, population, character, intelligence, education, physical condition, racial characteristics, and demands of the people for whom it is intended.

PRACTICE OF DENTISTRY DEFINED

Any person shall be understood to be practicing dentistry within the meaning of this Act who shall display a sign or in any way advertise himself as a dentist, or who shall, for a fee, salary or reward, paid directly or indirectly, either to himself, or to some other person, perform an operation of any kind upon, or treat diseases or lesions of, the human teeth or jaws, or correct malposed positions thereof; but nothing in this Act contained shall prohibit bona fide students of dentistry from operating in the clinical departments of the laboratory of a reputable dental college, or an unlicensed person from performing merely mechanical work upon inert matter in a dental laboratory or a licensed physician from extracting teeth practicing oral surgery or treating diseases of the mouth.

LEGAL PRACTITIONERS

This Act shall not affect the right of dentists under the law of the State of Michigan, to practice dentistry at the time of the passage of this Act, but no dentist shall be exempt from paying an annual license tax as hereinafter provided.

ILLEGAL PRACTITIONERS

All unregistered and unlicensed dentists who engage in the practice of dentistry in this state are illegal practitioners and will be liable to any or all the penalties hereinafter mentioned. (See Section 28 of the Massachusetts laws for a comprehensive description of illegal practitioners; also the California law Section 19 for what constitutes a punishable misdemeanor.)

PROSPECTIVE PRACTITIONERS' CERTIFICATE

It shall be unlawful for any person, who is not, at the time of the passage of this Act, engaged in the practice of dentistry in this state, to commence such practice unless he or she shall have obtained a certificate, as hereinafter provided.

EXAMINERS

A Board of Dental Examiners. Who shall be eligible? We think that:

(a) The members of the faculty of the dental college should *never* be eligible to the board of dental examiners while connected with a college.

(b) No medical doctor should be eligible unless he is a practicing dentist.

(c) The Board should be composed of practicing dentists of long experience, well-known character and professional ability, and endowed with strong *common sense.*

EXAMINERS' APPOINTMENT EXPENSES

The election of the members of the Board of Dental Examiners should be held by the dentists of the state through the members of the state dental society. Vacancies for unexpired terms should be filled by the board of examiners. The Governor can then appoint the examiners from the *list* provided by the state society. Compensation and mileage and necessary expenses of each examiner must be adjusted according to the financial condition of the dentists in the state.

RE-REGISTRATION

The annual registration of dentists in active practice by the secretary of the board of dental examiners should be required by a fixed date, say October 31st, each year, with appropriate penalty attached for failure to comply with the law, such as fines, or forfeiture of license, or both. Without yearly registration, it is impossible to keep track of illegal practitioners.

LICENSES

Licenses shall be granted upon examination by the board to successful applicants. Annual renewal of licenses should be required from all dentists who contemplate continuing in active practice in the state.

TEMPORARY LICENSES

Many states yet grant temporary licenses upon certain conditions being complied with. This favor is possibly necessary in some states, but we believe it should be eliminated wherever possible. The license of each applicant should be signed by *all* the members of the board after *joint* consideration.

APPLICANTS

The applicant should be excluded who is deaf, dumb, blind, mentally deranged, quasi-incompetent. Those afflicted with an incurable chronic or a contagious disease should not be eligible for examination, including paralytics, epileptics and victims of cancer, chorea, leprosy, syphilis, tuberculosis or trachoma, heart disease, locomotor ataxia, Bright's disease, or any one convicted of fraud, crime or drunkenness.

(a) The applicant must be a citizen of the United States of America.

(b) The possession of a certificate of graduation from a standard high school, four years' course of study, or the State University entrance requirements should be insisted upon as a preliminary educational requirement for matriculation into a dental college.

GRADUATES

The possession of a dental degree by the applicant from a "reputable" dental college should be insisted upon by the Board of Examiners.

NON-GRADUATES

Should non-graduates be excluded from examination? This is a question for you to settle among yourselves. The Massachusetts law is the most liberal upon this point. It says: "Any person twenty-one years or over may be examined." (But we will quote as evidence of the fact that this liberality is not abused, that, in 1908, out of one hundred and fifty-five unassigned applicants only thirty-eight passed the Massachusetts Board.)

EXAMINATIONS

Every applicant shall pass a practical and theoretical examination in operative and prosthetic dentistry and its specialties, also theoretical examination in all collateral branches.

RECIPROCITY

Interchange of licenses between Boards of Dental Examiners should be provided for, based upon *equality* of standards, the Board receiving the application to constitute the sole judge of *standards*, and *both* states interchanging with each other.

PENALTIES

The law should impose fines and imprisonment, or both, for failure to comply with the dental laws. The former amounting to from $100 to $300, and imprisonment from three months to one year, according to the *violation.*

REVOCATION OF LICENSE

Revocation of the license for deceit and cheating, crime, conviction, immorality, mal-practice, and advertising should be insisted upon.

PUBLICITY OF RECORDS

All records of Boards of Dental Examiners should be open to the inspection of the *public* at any reasonable time.

(*To be continued*)

ENLARGEMENT OF NASAL SINUSES IN YOUNG CHILDREN BY ORTHODONTIA*

By E. A. Bogue, M. D., New York, N. Y.

MY FRIEND, Dr. G. V. I. Brown, of Milwaukee, in his excellent paper read before this section last year, refers to having used direct and rapid pressure to expand the maxillæ for some years prior to the report on this subject made by Dr. Nelson M. Black, also of Milwaukee, in 1901. Dr. Charles E. Quimby, of New York, reported one of his cases before the Academy of Medicine in 1903, in which report he described the straightening of the nasal septum by means of an apparatus constructed and attached by himself, which had opened the suture of the upper maxillæ.

Dr. W. Pfaff, court dentist at Dresden, Germany, in 1904, read a paper at the Congress in St. Louis, entitled "Stenosis of the Nasal Cavity Caused by the Contraction of the Palate and Abnormal Position of the Teeth: Treatment by Expansion of the Maxillæ."

In 1905 I read a paper at the annual meeting of the British Medical Association, entitled "The Influence on Development of Arranging Irregularly Placed Teeth into Normal Positions."

The incentive to the preparation of this 1905 paper was the success that had seemed to follow certain operations on the temporary teeth of young children, which operations I began in 1899, and have been following up ever since.

These operations consisted in gradually spreading the arches of temporary teeth, when it became evident that Nature was not doing the work herself, thus carrying outward to the proper places the crypts of the permanent teeth, which then erupted more nearly where they belonged.

As a result of these operations I noticed in every case what seemed to me an increased development in the nasal passages, a straightening of the nasal septum, and a diminished tendency to take cold. I need not mention further the marked improvement in personal appearance, beauty, sonorousness of voice and ability to enunciate clearly and distinctly, as well as to masticate properly, and to have clean teeth not predisposed to decay.

Distrusting my own powers of observation, I began in 1906 to request assistance from several rhinologists, who were better able to make these observations than I, and who were at the same time unbiased.

These physicians have examined several children before anything was done to their dental arches; and later, when I had accomplished about all the spreading that I intended, they have in several cases examined again.

I shall have the honor to present at this time a report on two or three of these cases in which the arches could not have been subjected to rapid spreading, as the work was done on the temporary teeth. At the same time

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*Read in the Section on Stomatology of the American Medical Association. Published in THE SUMMARY by special arrangement with the Journal American Medical Association.

I shall report on some other cases that might have been subjected to rapid spreading with advantage, but for certain reasons it was thought best to work with the ordinary expansion arch. The results certainly are gratifying, although they seem to differ from the conclusions of Dr. Faught, even as Dr. Nelson Black in his paper before this section last year found his "clinical results entirely to disprove" Dr. Faught's assertion that expansion methods could not relieve stenosis due to adenoids or septal irregularities.

I have in perhaps twenty or thirty cases succeeded in relieving nasal stenosis by gradual expansion of the arches of temporary teeth, promoting thereby nasal breathing, which function, when it is performed, tends to produce a normally widened nasal passage. I shall allude to two apparent exceptions to this during my report.

My conclusion is that in those cases in which a rapid spreading of the upper maxillary is applicable—that is, in which permanent teeth are sufficiently developed and erupted for the operator to be able to attach his apparatus firmly and to apply the necessary force promptly—that method is distinctly preferable for the correction of the class of nasal stenoses that has been under discussion, and for the reasons given by Dr. Brown last year. When, however, the difficulty is recognized early enough to have it corrected by means of apparatus attached to the *temporary* teeth, I have found that the latter method, being to a great extent preventive, becomes distinctly preferable.

When slight pressure is brought to bear in these regions to overcome the "restrictions in the region of the palate and alveolar structures," it is in the direction of normality that the pressure is applied, hence the resumption of the proper functions of the parts is soon brought about, and with the performance of function comes development, and it comes so easily in many cases that we hardly realize that the deformity has been overcome until we see before us a normal condition.

On Nov. 10, 1906, Dr. T. Passmore Berens examined a little girl, 9 years and 9 months old, and made the following note:

> L. G. protruding upper teeth; rather high arch to the palate; nose shows deflection of the cartilaginous septum, extending into the vomer and perpendicular plate of the ethmoid, the deflection occupying the whole of the middle meatus of the nose from just above the anterior end of the inferior turbinate and causing a strong contact between the septum and the middle turbinate; tonsils present, but not enlarged; but very slight adenoid tissue in the vault of the pharynx. Left side of the septum shows a concavity of the deflection to the right.

On March 14, 1908, came the following report in regard to the same patient:

> I have just examined L. G.'s nose, and find a most marked difference in her nasal septum in that it is now almost straight, and whereas before it was deflected sufficiently to be in contact with the left middle turbinate there is now perfectly free breathing space between these two parts. The concavity that was present on the right side is practically lacking.

Dr. Berens, on April 4, 1908, examined the nose of a little girl, 14 years of age, and wrote:

Examination revealed a sigmoid deflection of the septum, the main portion of the deflection being high up on the right side, where the cartilaginous septum is in contact with the middle turbinate. The middle turbinate is not enlarged. The septum on the left side curls into the inferior meatus by a sharp edge, occupies about one-third of the inferior meatus, and gradually diminishes to become lost in the vomer. There is a slight thickening of the septum on the right side near the floor.

April 21, 1909, the record of Dr. Berens' examination of this patient reads:

The effect on the nasal septum is very marked. In fact, the deflection that was present is now almost entirely absent, although the thickening on both sides persists.

The septum has almost entirely straightened, and this straightening necessarily has resulted in a complete opening of the nostril that was almost occluded by the previous deflection of the septum, so that I now consider the nasal passages to be in a normal condition.

The next is an experimental case. Miss J. J., aged 16; first examined by Dr. W. Sohier Bryant:

April 10, 1907: Nose and mouth-breather. Marked nasal insufficiency. Developmental nasal occlusions 3.9 mm. maximum nasal compressibility at edge of nasal bones; 2.3 cm. from apex of nasal arch to apex of spine of superior maxillary. Nasal orifices measured 4.7 mm. by 11.0 mm.

May 13, 1907: Nasal breathing easier.

June 13, 1907: Still further improvement in nasal capacity.

Oct. 21, 1907: Nasal air supply sufficient. Nasal fossæ and nares well open.

Nov. 1, 1907: Breathes well through nose most of the time. Nasal orifices, 5.5 mm. x 14.0 mm. Can get more than enough air through nose. Three cm. from apex of nasal arch to spine of superior maxillary bone. The dilator nasi motionless.

From the above observations, extending over six and one-half months, we see that the capacity of the nose increased greatly during the time the patient was under treatment for expansion of the dental arch.

The next case is that of a little boy, 7½ years old, for whom it was determined to spread the dental arches without removing the adenoids, his father recognizing no need for such procedure. Dr. Bryant's report is:

Feb. 18, 1907: Nasal insufficiency, but a nose-breather. Narrow, slightly vaulted palate. Nasal septum showed spur on the left side. Hypertrophied tonsils and adenoids.

May 3, 1907: Nasal breathing slightly improved. Adenoids and hypertrophied tonsils, and mucopurulent nasopharyngitis.

Feb. 11, 1909: Palate seems normally developed. Septum appears straight. No spur. Nasal fossæ large. Free nasal breathing.

From the appearance of the patient when I first examined him I expected that the nasal breathing would continue to deteriorate and that the nasal septum would become more irregular. Contrary to this expectation, when I saw the patient on February 11, the nasal breathing was much improved, and the nasal septum was normal. The patient still had hypertrophied tonsils and adenoids.

Dr. Charles E. Quimby writes:

The possibility of straightening more or less the bony nasal septum through change in the relations of the superior maxillæ is no longer open for discussion so far as I am concerned. I have done it. In the case reported the deformity was purely developmental and the result has been perfect and permanent restoration of nasal respiration. Any "spreading of the upper dental arch" which changes the relations of the maxillæ must affect the nasal septum. In my case the maxillæ were separated by apparatus acting on the teeth, as shown not simply by separation of the central incisors but by opening of the suture the entire length of the hard palate. In another case under my observation change in the dental arch was followed by slight enlargement of the nasal meatus, but without change in the septum.

It would seem obvious that this method of correcting nasal defects is applicable only to developmental deformities, and that the best results will be obtained before the maxillary suture is finally closed.

My two cases that seem to be exceptions were these:

A little girl, whose arches I began to spread when she was 7½ years of age, improved in health and strength and ruddiness constantly for two years from the time the apparatus was first put on. Letters from her father and her mother allude to this because they both were apprehensive that the strain would be too great for the child, who had scarcely recovered from a severe and dangerous illness. They were kind enough to write me of her good condition, and that she had not suffered a day during the operation. I was correspondingly pleased. I have just learned (after three years) that her father, who is a physician, finds the inferior turbinates hypertrophied on both sides, "so much so as to nearly meet the septum. On the right side the middle turbinate is in contact with the septum," and he fears an operation may be necessary.

The other case was that of a boy, about 15 years of age, who was brought to me by Dr. Bryant to inquire why there was still a deviated septum after the boy had undergone in Boston the ordinary operations for regulating the teeth.

A careful examination with measurements very soon revealed the fact that, while the teeth had, indeed, been regulated the arches had not been spread at all; hence there could have been no enlargement of the nasal passages or straightening of the septum, and I recommended the application of direct pressure by means of a screw and the prompt separation of the maxillæ.

Epitomizing my experiences and those of all whom I have consulted, it would seem that the best results obtainable, both for nasal passages and the dental arches, are those which follow on orthopedic or orthodontic operations, commenced as early as the diagnosis can be clearly made; and these operations are accomplished by gradual pressure, stimulating normal growth; but when the child has reached 15 or 16 years of age or more the nasal septum is most promptly and easily straightened by the application of positive force, rapidly applied, and retained until the nasal troubles are remedied, after which the dental arches can have the ordinary orthodontic treatment, which they may then be found to need, involving the osteoclastic changes on the further side of the pressure, with corresponding building-up on the hither side.

Since writing the above, two letters have been received—one from Dr. John J. Cronin regarding a little patient of his, 6 years old, supposed to be a perfectly healthy baby until attention was called to the fact that his temporary teeth were a little crowded, and that the permanent teeth would have difficulty in erupting properly. An examination revealed ten or more cavities in these temporary teeth requiring fillings.

The one thing that marred the picture was that seemingly insufficient exposure would often result in attacks of croup. A spreading apparatus was applied to the temporary teeth. After about ninety days the doctor writes:

> The spreading of his dental arches is synchronous with a less irritable disposition. He has not had an attack of croup in the past three months, and, as far as one in good general practice can judge, there has been more croup than usually comes. The boy's general aspect has changed, and there can be no question that his nervous balance is greatly enhanced. The apparatus at no time has caused him the slightest inconvenience. From a thin peaked-faced child the boy has developed into a broad square-jawed individual. The nasal chambers have increased in size. I regret I could not follow out your request to measure the chambers before and after, as when I first visited the instrument shop they did not have the calipers.

The other letter to which I am permitted to refer is from Dr. W. K. Rogers, of Columbus, Ohio, to Dr. C. A. Hawley, now of Washington. Dr. Rogers writes:

> The W. children, whose adenoids and tonsils I removed a year ago, were brought in for observation today (April 23, 1909). It is worthy of note that in the older child whose upper alveolar arch you have been treating, and in whom, as well as the younger, there was a distinct element of nasal stenosis when I first saw them, improvement in nasal respiration has been much more marked than in the younger child, for whom you have only just instituted this procedure.

ABSTRACT OF DISCUSSION.

Dr. Eugene Talbot, Chicago: If the essayist had intended to take up the literature on the subject, it is strange he should not mention the 14 or 15 cases I recorded in the nineties in my work on "Osseous Deformities of the Head, Face, Jaws and Teeth" and "Irregularities of the Teeth." They were the first 14 cases ever placed on record. This operation is becoming one of the greatest for the relief of humanity.

Dr. Rhein, New York City: I want to echo the sentiments of Dr. Talbot on this matter, that the value of presenting this treatment, not only to the laryngologist and the general practitioner, but to the world at large, is of inestimable value in the correction of one of the most unfortunate deformities that we find in childhood. I do not know whether Dr. Bogue intended to present this as something novel, for not only is the work of Dr. Talbot in this respect well-known, but these results have certainly been understood in our specialty for the past twenty-five years and have been more or less generally practiced. My record books will show a number of cases of children started as early as these for the accomplishment of this result. I do not believe there is anything new in the past ten years in the handling of the jaws before the eruption of the permanent teeth. A number of the older men are constantly decrying the handling of the jaws of children before the permanent teeth are erupted, claiming that our interference in this respect is frequently called for before we see what nature will do for the child, but it is the history of such cases as portrayed by Dr. Bogue that should put an end to criticism of this kind, because nothing is going to be more beneficial in the physical improvement of the individual than to eliminate insufficient breathing as early as possible in life.

Dr. George V. I. Brown, Milwaukee: Dr. Bogue's measurements show that he does get results. Fine spun theories are all very nice, but exceedingly busy men have not time to go into details of these matters. They want things done so that they can recognize them, and done promptly. I was glad to hear Dr. Bogue report some cases that were not so successful. He has given us much food for thought in this direction. The fact that in one of his cases there appeared to be a tendency to reversion to the original condition, when it was apparently cured, is exceedingly interesting. I hope Dr. Bogue will follow this case up, determine the final results, and report later.

Dr. Arthur Zentler, New York City: I happened a short time ago to speak to the former director of the Metropolitan Opera House School for voice production. This lady told me that whenever a young pupil applying for admission had defective sounds, she sent the applicants to the rhinologist for examination. After a time she found such improvements that she inquired what caused such good results. The rhinologist replied: "I send them to the orthodontist to spread the dental arch and get a larger opening into the nasal passages." I think this statement shows as much as possible the results Dr. Bogue has spoken of.

Dr. E. A. Bogue, New York City: My only object in writing the paper was to bring testimony. As Dr. Rhein has stated, there is nothing new in it, but so many were inclined to cast discredit on the statements made by some orthodontists that I thought it worth while to get the testimony of the rhinologist who is entirely impartial. The only other feature worth mentioning was the one that my friend Dr. Brown mentioned in his paper, that this work can be done when rapid spreading is not possible.

REPORT OF COMMITTEE ON DENTAL SCIENCE AND LITERATURE*

By Marcus L. Ward, D. D. S., Ann Arbor, Mich.

IN fulfilling the duties of this committee, by bringing to your attention anything which may appear to be progress in dentistry, there is one contribution which the writer desires to invite your attention to, not because it is entirely new, but because its teachings in my opinion should be heeded more generally by dentists and especially those practicing the newly created specialty of dentistry, prophylaxis. This contribution appears under the head of "The Dental Relationship of Arthritism" in the transactions of the National Association for 1909, and *Cosmos,* July, 1909, written by Edward C. Kirk.

In the beginning of the article he says, "It has long been recognized that the susceptibility to disease is more pronounced in certain individuals than it is in others, and from very early times this peculiar tendency has given rise to various theories as to its origin. It has been referred to as dyscrasia or as a diathesis, acquired or inherited, and much of the old humoral pathology involved the same conception. Modern investigation is slowly evolving the solution of the problem by studying the nature of the defensive forces of the organism, and results thus far attained justify the belief that certain definite substances in the blood and body juices of immune individuals constitute the means upon which the defensive mechanism is based. These defensive bodies—as antitoxines, agglutinins, bacteriolysins, and opsonins, as they are variously described—appear to be coincidental with that condition of sound bodily health which is the result of a normal physiological equilibrium, and are absent or less active when the normal physiological equilibrium is disturbed. In proportion as the study of bacterial invasion has developed the underlying principles which upon the one hand determine how invasion takes place, and upon the other hand how the invasion is combated by the normal defensive mechanism of the body, the attitude of medical science toward the problem of disease has tended to focus itself more strongly upon the prophylactic side, and to address its efforts to disease prevention by building up the natural defensive forces of the organism to their highest efficiency. The crusade against the spread of tuberculosis by enforcing better hygienic conditions, both personal and environment, let the successful warfare against yellow fever by destruction of the breeding-places of the mosquito, and similar efforts to eradicate the unhygienic conditions that harbor the common house-fly, the house-rat, and similar carriers of disease germs are common and familiar examples."

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*Read before the Michigan Dental Association, 1910.

The lesson we might draw from the quotation is that medical science was tending to focus itself upon the prophylactic side and combating disease by the natural defensive forces. Dentistry has made great strides in this department so far as the art side of it is concerned. The much used gutta percha for fillings of comparatively permanent nature has been practically eliminated because of the unhygienic nature of the material. The use of phosphates for fillings except temporary operations, has largely ceased. The insertion of slow setting alloys has become history because of the plastic nature of the material permitting it to be thrust forward toward the cervex of the tooth after the final as well as the initial setting. The careful adjustment of a matrix for the insertion of the plastic materials in proximate cavities has become common practice. Alert to the difficulties attending finishing of the cervical portion of the proximate gold inlays the profession has grasped the cast gold inlay, with the result that more prophylactic operations are performed in many of such locations. The banded crown has been largely displaced by the cast base and plate and dowel, and almost every phase of prosthetic dentistry has assumed the garb of prophylaxy. No period of dentistry has ever had such a reconstruction in the order of things from the art standpoint, though I doubt if it ever has been more indifferent to a treatise like the one referred to, which to say the very least, contains many scientific explanations of phenomena. This condition was brought forcibly to the attention of this committee last winter by a member of our profession who came from Germany to Ann Arbor via New York and Philadelphia, for the purpose of studying the art as well as the theoretical side of the practice of prophylaxis and the treatment of pyorrhea.

He went from Ann Arbor to Toledo, Cleveland, Indianapolis, Chicago, Kansas City, St. Louis and after some weeks back to Ann Arbor. He had met with many helps and suggestions from some of the ablest men in the profession but he had observed a tendency on the part of many of the very strongest ones to speak derisively at the mere mention of the term pyorrhea.

One of them who has done a great deal for dentistry is reported to have said "damn pyorrhea. How can you expect the profession to understand pyorrhea when it has made so little progress in the knowledge of caries?" One of the first questions asked me by this foreign guest was, "Why are so few of the thinking men in your profession in America interested in the cause and treatment of pyorrhea?"

This same condition as was observed by our German friend has been noticed by about every one who has recently had the management of one of our programs. Just why a scientific worker in the profession should treat lightly the work of those most enthusiastic in the art side of it is not clear. Neither is it obvious why the enthusiasm of many of those practicing art prophylaxis should cease so abruptly when the apex of the tooth is reached. Can it be that either the art practitioner or the science practitioner believes that either branch can succeed alone? It is possible that some of those practicing preventive dentistry, as related to oral hygiene and treatment of pyorrhea, believe that preventive dentistry should be practiced only in the oral cavity. Or, can it be that some of our scientific men have failed to observe the changes in almost every department of the art side of our work, brought about almost entirely by the enthusiasts in prophylaxis. Whatever the case may be, it must be remembered that art always relates to something to be done and science to something to be known, and that the word profession implies attainments in both, as distinguished from mere skill or the pursuit of a mere study or investigation. That dentistry has progressed in the lines referred to there can be no doubt, though it appears that the particular branch referred to by Dr. Kirk in the article mentioned, has not received proper recognition by the profession and especially by those professing to be the principal exponents of preventive dentistry. In regard to the relation of food habits to systemic vulnerability, Dr. Kirk further says, "A more recent crusade, and, while less dramatic, a by no means less important one for the reinforcement of the bodily defenses against disease invasion, is the dietetic propaganda inaugurated by Mr. Horace Fletcher, who has demonstrated by many examples and by various series of carefully conducted scientific tests that human efficiency, measured either as units of potential, as intellectual effort, or as resistance to disease invasion, is directly related to the question of nutrition, and he has incidentally shown that our conceptions of the standards of normality in the nutritional process, in so far as they relate to intake of food in relation to output of work, have heretofore been wrong. Mr. Fletcher has shown that we have not only eaten too much, but that we have eaten badly, and that in thus overfeeding ourselves we have invited disease from without by creating it from within.

"The dietetic question in relation to health is a very ancient one; indeed, the consideration of some of its aspects must, in the nature of the case, have been coincident with man's earliest attempts to feed himself. Like all other intricate physical problems, whatever knowledge was attained in relation to it was derived wholly from empirical observation until quite recent times, when this vital question, like all other phenomena of nature, was brought under the exacting scrutiny of precise scientific study. It has been observed for years that excessive feeders died, as a rule, earlier than the more abstemious, and it further became known that certain types of disease were more common among the overfed, indeed were characteristic of the so-called 'high liver,' and still later it was noted that these over-nourished individuals were actually manufacturing within their own bodies, as an output or waste product of their disordered nutritional processes, certain substances that were poisonous in character and which exerted a toxic effect upon the entire organism, this effect becoming intensified until it became fatal to the individual, or so reduced the natural defenses of the body that he was carried off by an acute disease due to a bacterial invasion from without.

"The development of the idea of a dietetic state or condition due to faulty nutrition and culminating in auto-intoxication or self-poisoning, with reduction of the defensive forces against bacterial invasion, has had its principal growth and most pronounced expression in France, and it is due to the devoted labors of certain eminent investigators of that country that this important view of disease production has attained scientific prominence and is gaining a wide practical significance.

"Prof. Dr. Van Noorden, of Frankfurt A. M., in his monograph on 'Diseases of Metabolism and Nutrition,' says: 'Within recent years the idea has become firmly established in the minds of physicians that a variety of morbid phenomena are due to auto-intoxication—are, in other words, attributable to certain poisonous metabolic products. This view, it is true, is not new, for it was familiar to the physicians of past generations, and was part of the teachings of the medical folk-lore of long ago. It was not, however, until Bouchard and his pupils published their investigations on the subject of auto-intoxication that this theory attained the dignity of a scientific doctrine. At first we German physicians were by no means inclined to accept the theory of auto-intoxication that was being so enthusiastically proclaimed. Of late years, however, our attitude has become more friendly to the doctrine; this change of front is due to the fact that a number of toxic products of metabolism have actually been isolated, and their mode of origin in the organism and their pathological effect determined to the satisfaction of the former critics of the doctrine. We do not, of course, know all that we should properly know about the poisonous metabolic products that we incriminate in so many morbid states; but in a large group of important symptom-complexes we are fortunately in possession of a number of facts that suffice to ground the doctrine of auto-intoxication on a solid chemical basis.'

"I have made the foregoing quotation from an eminent exponent of German scientific conservatism to emphasize the fact that the doctrine of auto-intoxication as a factor in disease causation and as a prodromal state of bacterial invasion rests upon an accepted scientific foundation. It is also to be understood that the phase of auto-intoxication here under consideration is that which is due to faulty metabolism the result of disordered nutrition, and is exclusive of intoxication resulting from the absorption of putrefactive toxins produced by intestinal bacteria."

After a liberal discussion of the subject of arthritism he takes up the various pathological expressions of nutritional imbalance as follows: "Time will not permit a more extended recital of the progressive phases or detailed phenomena portrayed by the author from whose graphic picture of arthritism I have drawn with these few examples of its varied expression. Indeed, so manifold are the clinical manifestations of the underlying morbid state of nutrition induced by an ill-balanced food habit with respect to the needs of the individual, that any description must needs be but schematic and general in character. What I do hope to emphasize is that there is such a state as a physiological nutritional equilibrium, which, when over-balanced upon the side of nutritional excess, develops a condition of disease within the economy itself which may have a variety of local as well as general manifestations, and which further becomes a precursor of other disease phenomena by lessening vital resistance so that invasion of pathogenic bacteria becomes possible. The secondary pathological expressions of over-nutrition which characterize the arthritic state may manifest themselves in widely different ways from a clinical standpoint, depending upon the character of the organs or tissues which are most prominently involved; thus the groups of symptom complexes may be such as arise from liver complications, with structural as well as functional disturbances of that organ and of the pancreas, and produce the type of individual designated by Pascault as the hepatique, or the kidney may become the seat of lesions with a corresponding train of disturbances creating the type renal of the French, and similarly the disorder may have its dominating expression as the nervous or catarrhal, according as the corresponding structures and tissues are most prominently involved; but in all these classes the underlying fault or aberration from physiological normality appears to be a lack of nutritional balance characterized in its beginnings and through its formative period by over-nutrition, due to the intake of an excess of pabulum, which is beyond the power of the organism to properly utilize.

"It is in precisely the group of morbid states here under consideration that we find the majority of those disorders which affect the tissues constituting the retentive apparatus of the teeth, and which we collectively designate as interstitial gingivitis, pyorrhea alveolaris, etc., as well as that other disorder the etiology of which has so long been shrouded in mystery, viz: chemical erosion of the teeth. Medical literature abounds in reports of the coincidence of destructive necrotic inflammations of the alveolar structures with the various nutritional disturbances due to the arthritic condition. The whole of the major work of Talbot on 'Interstitial Gingivitis' is a research which by any candid and intelligent reasoner should be accepted as a demonstration that the auto-intoxication resulting from malnutrition is the principal factor which leads to bacterial invasion of the alveolar structures, causing destructive inflammation of the supporting tissues of the teeth. M. L. Rhein, in a paper on the 'Oral Expressions of Malnutrition,' read before the Odontological Society of New York in March, 1896, and again in a paper on 'Pyorrhea Alveolaris,' read before the Chicago Dental Society in February, 1899, has clearly related the alveolar disease to malnutrition as its general predisposing cause. C. N. Peirce, H. H. Burchard and others too numerous to mention, have advocated the same view, and it is at least worthy of note that in the majority of instances those who have held to the malnutrition theory have based their convictions upon the results of scientific research, as well as upon careful clinical observation.''

Just how many of these cases of auto-intoxication as a result of malnutrition escape our observation each year cannot be stated, though the number is probably sufficient to decrease the pride to which we point as keepers of the gate. I confess that too many have escaped my observation. A little over a year ago one of the most violent attacks of erosion was observed on the six anterior teeth of one of the writer's patients. It had destroyed large areas on the superior central incisors and areas of a smaller size on the other teeth all within a period of four months. All twelve areas were painful with even mild irritants. Each one was surrounded by a band of partially decalcified enamel ragged in the extreme at the edge. These eroded areas were treated with formalin for several minutes, after which sodium carbonate was applied. This treatment was applied every other day till three applications had been made, when all sensitiveness disappeared. The patient was referred to a specialist in nervous diseases, who, after a careful examination, called me over the telephone and asked if that was one of those mysterious cases of erosion so much talked about in dentistry. After some conversation regarding the case the specialist remarked that not only were the osseous tissues in other parts of the patient's body eroded, but many of the softer tissues were in a like condition. The patient from that time till the present has had occasional services from the physician, but no treatment from me except to confine her to the use of a paste and aid her in her oral hygiene. The eroded areas have not enlarged. The exposed dentine appears to have hardened markedly and the patient has been comfortable in every respet. Until we as dentists recognize many of these lesions as but oral expressions of malnutrition and morbid pathological tendencies can we lay just claim to suitable progress in dental science.

In the *Cosmos,* January, 1910, may be found some consolation for those who have always claimed that the tissues of the teeth were similar to the other osseous tissues of the body in regard to softening and rehardening. In this article under the head of "Enamel Softening and Rehardening as a Factor in Erosion," Dr. Joseph Head says, "Up to the present time enamel softening has been considered to be necessarily associated with roughening of the surface, loss of lustre, and dissolution of the cemental substance that binds the enamel rods together; and whenever enamel decalcification is associated with decay of dentin this conception of enamel softening is only too accurate. But may not this conception be only a part of the story, so to speak—the final part rather than the complete process of enamel degeneration? It is with that idea that I now report the results of the experiments contained in this paper." Following this he describes his experiments which appear to be carried out in the manner that is characteristic of most of his work. In conclusion he says, "These tests seem to show that partially softened enamel may have the power of becoming hard again. This rehardening is difficult to explain, as the formulas of inorganic chemistry appear hopelessly ineffective in dealing with the complex enamel molecule, and concerning the enamel our present chemical knowledge goes no further than inorganic chemistry. The hardening may be a sort of recrystallization within the enamel substance; it may reunite with something taken from the saliva, or the enamel being largely composed of carbonate, the CO_2 of the breath may have something to do with rehardening, just as the soft Bermuda limestone hardens when exposed to the air. I freely admit that I do not understand how it can happen, but I firmly believe that it does happen." In the *Cosmos* for April, 1910, Dr. I. N. Broomell presents an article entitled, "The Adventitious Effect of Large Masses of Gold in Contact with Tooth Tissues." He says, "Ever since the introduction of crown and bridge work into the dental profession there has been more or less discussion in regard to the deleterious effect of large masses of gold in contact or nearly in contact with vital tooth tissues. Some operators have contended that no bad results would follow such operations, while others have been equally confident that the good offices of the supporting teeth would be naturally interfered with by completely or partially boxing them in with gold.

"The former class, true to their convictions, have not hesitated to attach large or small bridges to vital teeth, either by partial or entire gold caps, while the latter class have invariably devitalized the pulp before performing similar operations.

"Clinical experience in general in regard to the ultimate effect of these operations has been such that deductions widely at variance have been arrived at. We have all had cases in which the vitality of the pulp has been lost in the course of time, under partial or full gold caps; likewise we have all had many cases in which under similar conditions the pulps have remained *apparently* undisturbed. In view of what it is proposed to relate in this paper, the qualifying word in the foregoing sentence cannot be too forcibly emphasized, that is, the pulps are *apparently* undisturbed.

"As a result of the microscopic study of a number of cases it is proposed to show that almost invariably the pulp tissue, and as well the enamel, dentin, and alveolo-dental membrane, are all more or less affected in various ways by such unnatural surroundings. Among the morbid effects produced are hyperemia of the pulp, dry gangrene of the pulp, calcification of the pulp tissue, sclerosis of the blood vessels of the pulp, atrophy of the pulp, pulp nodules, secondary dentin, expansion of the dentinal tubules, with corresponding bulging of the dentinal fibers, pathologic pigmentation of the enamel and dentin, non-carious destruction of the enamel, as well as destruction by caries and perhaps a molecular change in this tissue. Any one of the foregoing may be the primary affection after which a train of pathic conditions may ensue."

After describing numerous experiments and presenting several slides he closes with the following deductions:

"My deductions therefore are as follows:

"(1) That the effect upon the tissues of a vital tooth when partly or entirely encased by large masses of gold is in the majority of instances more or less harmful.

"(2) That this is especially so when the terminal branches of the dentinal fibers are exposed.

"(3) That there may be a non-carious destruction or disintegration of the enamel in connection with disintegrating cement beneath these masses of gold.

"(4) That there will follow in nearly every instance pathology of the pulp, which in turn will result in its death.

"(5) That the peridental tissue suffers more from mechanical irritation than from overwork.

"(6) That all the foregoing conditions are less likely to occur when gutta-percha is substituted for cement."

We cannot but welcome the presentation of microphotographs illustrating these changes which to many of us have been supposed to exist, but which have not been shown to exist. There is one of Dr. Broomell's deductions, which, while correct beyond any doubt in some respects, appears very misleading in others. He says, "that all the foregoing conditions are less likely to occur when gutta percha is substituted for cement." This deduction implies that all cements are alike, an inference which would unquestionably not be drawn by one who had made a study of cements, nor by one who was a keen observer and had used liberally one of the recently designed oxyphosphates of copper, especially the one made by the Ames Co., of Chicago, for retaining crowns, bridges, etc.

That directly the reverse of what Dr. Broomell has observed with the use of zinc phosphates would be observed with the use of copper phosphates there is no doubt in the mind of the writer. If there is any one branch of preventive dentistry that the profession has progressed in, more than in the gradual elimination of gutta percha for anything except the most temporary operations, it is remote from the writer's observation. Whether Dr. Broomell intended this deduction to stimulate the use of gutta percha or whether he simply wished to state that these conditions were less likely to occur with the use of gutta percha than cement cannot be stated. Two conditions, however, are growing to such an extent in dentistry that the latter would seem to be his intention. The first condition is that gutta percha is being used in less quantities because of the demands for better oral hygiene. The second is that zinc phosphates are being used in less quantities for retaining appliances, which are to remain in the mouth for a long period, and the copper phosphates are being substituted. Another contribution having a direct bearing upon one of the heretofore unsettled questions in dentistry appears in Items of Interest for August, 1909, under the title "Pathologic Lesions of the Living Pulp under Gold Shell Crown," by M. L. Rhein. To begin the contribution he says, "What is the effect of a gold shell crown cemented over roots containing a living pulp? A careful investigation of the clinical methods in vogue at the present time, as compared with years ago, shows a constantly increasing ratio of pulp removal where an operation of this kind is to be performed. This is unquestionably the result of clinical deduction from the large number of alveolar abscesses that have been caused by such procedure. In a lecture before the New Jersey State Dental Society, given in July, 1908, and published in the *Items of Interest* for November, 1908, a number of radiographs were presented for the purpose of showing the effects produced by placing such caps over teeth having living pulps. A favorite argument of those who still cling to this form of practice rests on the assertion that a certain percentage of cases of this kind have been under their observation for a number of years without any resulting alveolar abscess. The hypothesis that such operations are non-injurious is not based on sound pathological principles, when a careful consideration is given to the diseased condition that ensues from such irritation of normal pulps. Skilful radiography of many of these alleged successful cases would show an astonishing proportion of pathological conditions that are not suspected from external appearances. The gold cap, acting as an irritant, produces an inflammatory condition of the surrounding parts. The results of such inflammation can never be accurately predicted.

"Microscopic examination of pulps subjected to such an irritation show an endless variety of pathogenic degeneration. The one most constant form of resulting lesion is the well-known calcific degeneration, either in the form of pulp nodules or in concentric calcific masses. With this calcific degeneration there are always present other pathogenic degenerations, but the character of these seems to vary in different cases. Pulp removal has been placed on a scientific basis, and by means either of sodium and potassium, or of sulphuric acid, the finest canal can be explored to its end. (This excludes a very small percentage of abnormally distorted roots.) The practitioner who ignores the necessity of pulp removal and remains enamored of this illogical practice does not see all of his resulting failures. Alveolar abscess only results when infection has been able to take place, but the short life of many such roots capped over living pulps is rarely taken into consideration. How many such loosened teeth are removed by the patients' new dentist, to whom they have gone in despair, and been met by the statement that too little attachment remains to preserve the tooth in the alveolar socket? Unquestionably, most capped teeth of this class meet their fate in this manner. When considering the drain on the immediate circulation wherever this calcific pulp degeneration is taking place, it is only natural to suppose that this excess of arterial supply to the pulp is accomplished at the expense of the pericementum and ultimately of the alveolar socket itself. Only in this way can the great amount of exfoliation of such capped teeth be accounted for. Taking all these facts into consideration, can it be successfully denied that pulps should be thoroughly removed and the canals aseptically filled before gold shell caps are cemented into place? A propaganda, with illustrative clinical excerpts, is needed to aid in bringing the profession to a practical unanimity on this subject.'' It would seem that his statement that ''a propaganda, with clinical excerpts, is needed in bringing the profession to a practical unanimity on this subject'' would pass unchallenged by those doing any quantity of bridge work. Dr. Fred A Peeso in *Items of Interest* for 1910 under the head of ''Crown and Bridge Work Past and Present,'' says, ''As to the crowning of teeth with vital pulps, I think there has been a change from the early days when it was considered almost a crime to destroy the pulp, if there was any possible way of avoiding it.'' Dr. Clarence J. Grieves said recently in a paper before the Northern Ohio Dental Society that ''pulp devitalization and clean root surgery without damage to the vital apical cementum and the peridental membrane are the very foundations on which modern operative dentistry is reared. While it may not seem desirable in perfectly normal teeth, the question resolves itself into, first, whether we *can do* clean root surgery and *if we can*, next whether a few pulps are to be balanced in value to the whole human economy, as against the masticating powers of a larger bridge.'' Dr. Hart J. Goslee is on record in his book as saying, with regard to the feasibility of devitalization, ''For years no special thought was given to this feature, and such teeth as seemed to indicate restoration by crowning were treated much in the same manner as though fillings were to be inserted. The frequency of subsequent troublesome manifestations, however, including the ultimate death of pulps with the attending consequences of such pathological conditions as virulent peridental inflammations and alveolar abscesses, have since caused the subject to be more carefully considered, until it is now most generally conceded to be a safer precaution, in a great majority of cases, to destroy such pulps as a prophylactic procedure, as well as to facilitate the necessary mechanical preparation, when the crown is to entirely cover the end of the root.''

With such exponents of the principles of crown and bridge work as Peeso, Grieves, Goslee and Rhein not only unanimous on the subject of devitalization, but emphatic in expressing their views, it would seem that the profession in this section of the country, by crowning as many live pulps as they do, were not only neglecting to correlate and put into use the views of our leaders in this line of work, but were circumscribing their success and working at variance to the movement of preventive dentistry. In *Dental Review* for January, 1910, there appears a very interesting article entitled, ''The Modern Treatment of Trifacial Neuralgia,'' by Dr. Frederick B. Moorehead.

After confessing to a limited knowledge of the etiology and pathology he divides the different manifestations known as neuralgia into classes, as follows: 1, Cases due to general diseases. 2, Cases due to local irritation. 3, Intractable cases for which no cause can be assigned and which constitute by far the largest number. After discussing the different methods of treatment for different classes of neuralgia he concludes with the following: 1, Cases of trifacial neuralgia due to constitutional lesions should receive appropriate general treatment. This is a trite statement and is used only as a premise. 2, Cases due to local irritation call for local correction. 3, All cases should receive the deep injection of alcohol. This should be continued until it is clearly demonstrated that surgical treatment is necessary. 4, The deep injection of alcohol is the safest, simplest and most satisfactory treatment yet suggested for the treatment of trifacial neuralgia. 5, The Abbe operation should be selected in all operative cases.

Another contribution we should all appreciate appears in the form of a plea in *Cosmos*, April, 1910, under the head of ''Is It Necessary to Use Secret Formula Preparations in the Practice of Dentistry?'' by J. P. Buckley. He says, ''Sometimes I have a hesitancy and am under a forced embarrassment in speaking of proprietary remedies, because I meet at these conventions manufacturing chemists or their representatives who have certain proprietary remedies for sale. I do not know that I need to feel this hesitancy in speaking of secret formula preparations in this particular part of the United States, when I realize the stand that the Massachusetts State Dental Society has taken through the efforts of your Hopkins, your Squires, and other men whose names I might mention, and also the Connecticut State Society and other societies here in the east who are farther along even than we are in Illinois, despite our strong organization.

''If I use the word proprietary instead of secret formula, I wish to be understood at the outset that I have no objection to the use of a proprietary remedy, if it is an honest, ethical remedy. If there is nothing about that remedy, its manufacture, or constituents which tends to mislead the profession, if there is nothing about it or one or more of its all-important constituents that is not kept secret, I have no objection to its use. If that remedy is not forced upon the public to encourage that which is wrong—self-medication—I have no objection to its use, but if the remedy tends to mislead the profession and the public, if the manufacturer claims that there is in it one or more of the supposedly all-important constituents which is known only to him and his Creator, and distributes that remedy broadcast throughout the laity, teaching them that by its religious use they can keep their teeth from decay, which is not true, then I object to that kind of a proprietary remedy.

"The question that I am to answer this afternoon in my feeble way is: Is it necessary to use secret formula preparations in the practice of dentistry? I want to answer that in the beginning by saying that in my opinion it is not, and lest I may be accused of speaking against something for which I do not offer a remedy, I will call your attention to a few remedies that have been useful to me in my practice that are not proprietary, and do not savor of the secret formula variety. You understand, however, that I have no objection to the use of an ethical proprietary remedy."

After discussing the various indications for drugs and his formula for certain of these indications he concludes with, "I hope to have demonstrated the fact that it is not necessary to use secret formula preparations in the practice of dentistry." From the fact that Dr. Buckley discusses only drugs and medicines we must assume that he refers only to that branch of dentistry, though the title of his contribution would seem to imply that such materials as cements, porcelains, alloys, etc., were meant. From a close study of the drugs and medicines necessary to practice dentistry he is convinced that it is no longer necessary to use secret formula preparations, although I think if he were to make a similar study of almost any of the other materials used by us he would find the manufacturers of these products far in advance of the profession in a knowledge of these materials. The lesson we might draw from the article is that there is one branch of our work which can be carried on without the use of secret formula preparations if we would only do it.

While our literature abounds in articles deserving of mention in this report I will close with a brief reference to the contribution of the writer in *Cosmos*, September, 1909, under the head of "A Consideration of the Casting Process With Special Reference to Refractory Materials." The reference I desire to make is, the reference to dentists making their own investing compounds. It has been pointed out in this article that the so-called concrete problem enters largely into the element of constancy of form and must be taken into consideration when dentists attempt to make these compounds themselves.

CORRESPONDENCE

PYORRHEA ALVEOLARIS IN THE YOUNG.

By T. A. Gutherie, Woodland, Cala.

ON PAGE 214, The Dental Summary, March, 1911, I notice this statement, by D. W. Barker, D. D. S., of Brooklyn, N. Y.: "Patients seventeen years old don't have pyorrhea and you ought to know it." This seems a broad statement and may be true in Brooklyn, but will not hold good in California.

A 17-year-old lady presented herself for treatment in my office last week and I found decided evidence of the ravages of pyorrhea. The first and second bicuspids were more or less infected, while the alveolar septums between the first and second molars above and below were badly broken down. A pledget of cotton, 1-4 the size of a pea, around which was tied a silk ligature, could readily be passed between the teeth at the seat of trouble while it was an effort to get even the ligature between the teeth at the occlusal edges.

There was but little salivary tartar upon the teeth, but every infected tooth had more or less of the dark scaly serumal deposit, and between the molars there were pus pockets where the peridental membrane had sloughed out still deeper than the sloughed-out alveolar septum. If this is not a typical case of pyorrhea, what would you call it?

Not only this 17-year-old patient, but her sister who is some 2 years her junior presented herself the same evening with decided symptoms of pyorrhea in the mouth, though not so extensive as in her sister's mouth. Between the lower right first and second molars there is a decided sloughing of both the septum and peridental membrane. These cases are too much in evidence to be mistaken in a diagnosis.

CORRECTION OF PRONOUNCED LOWER PROTRUSION.

By F. E. Williams, D. D. S., Los Angeles Cala.

HAVE on my desk the September 1910 Summary in which is published the article of Dr. W. Wayne Babcock, M. D. of Philadelphia, Pa., read before the American Medical Association in June, 1909.

This paper having been read before the American Medical Association and published by the medical journals through the country has given it a stamp of fact, that together with the emphatic manner in which he makes the statement to the effect that we, as Orthodontists, have not corrected these cases of pronounced lower protrusion and that we further cannot and gives Dr. Angle's written statement (Any Orthodontic procedure is powerless to render improvement and double resection is the only resort) as further proof of our inability to accomplish such correction.

Dr. Babcock writes of Dr. S. P. Hullihen's operation of resection performed over sixty years ago, (all due credit to Dr. Hullihen), is the best we can do today. He makes the statement that since the operations of Dr. Hullihen, over sixty years ago, Dr. Ottolengui in 1896 and Dr. Blair in 1897, we have developed no further in our chosen calling; (that this apparently important subject has not been further developed by the orthodontist) and that "these deformities are beyond the range of the usual orthodontic practice."

The case Dr. Babcock presents to illustrate the impossible is not the extreme of the deformations, and I have one like it corrected and two cases any number of times worse, one of which has been published and while the other has not, the proofs are to be had.

This paper of Dr. Babcock's was read in June, 1909, yet in April of the same year the SUMMARY published a case of mine which had been corrected and was a very, very much more difficult case. Published two months before this paper of Dr. Babcock's was read and although it may have been well to publish Dr. Babcock's paper, it was done with no explanation that the correction had at least been made before the reading of the paper and a case much more difficult.

Also let us compare results of the finished case. It is admitted that in resection there is a great risk of a successful operation, that a non-union is likely to be the result, necrosis is likely to set in, scar tissue and a definite contraction as a probable result and lastly a mal-occlusion still in which case treatment by an orthodontist is indicated and consequently the absence of proper facial expression, while on the other hand our results are practically sure and to a degree more perfect; and that there is no call for the serious and risky operation as in resection.

It is also a fact, is it not, that the average dentist, as a reader, throughout the country will accept the essence of Dr. Babcock's paper as a fact and deem such cases as impossible and our profession as non-progressive or the material of the profession as lacking in ability; not competent.

There is in our profession as in others little enough ability; too much of the ever-present shortcomings, yet are we not entitled to our just credits, and should we allow the wrong impression to prevail?

Dr. Babcock is in error; is uninformed. We may excuse it in him but I claim we do not want, must not allow, the wrong impression to prevail and such statement of facts to be circulated without proper explanation.

In closing I would ask you in rebuttal to allow us space in an early issue of the SUMMARY and to publish this statement. It is a defense.

EDITORIAL

BE A LIVE ONE

A SMALL per cent. only of the practicing dentists attend dental society meetings and the reason for this seems somewhat obscure. Is it because the material presented at the meetings is not as instructive and helpful as these dentists think it should be?

Is it on account of expense in attending the meetings?

Is it because dentists think they already know so much that no one can teach them more?

Is it because dentists are so busy they cannot get away to attend societies?

Do dentists think they can read the papers when published by the dental journals and receive as much benefit as by attending the meetings?

Is it indifference on the part of the dentist?

Or, if none of these, what is the reason?

Let us consider briefly these suggestions as given:

While it may be true that the subjects for consideration at some of the dental societies are not as attractive as might be, there is seldom, if ever, a meeting where one cannot learn something new, or get some helpful suggestions, and most of the societies have excellent papers read and discussed.

Yet the papers presented are only one phase of the meeting. There are the clinics, embracing many practical methods and suggestions; discussions of methods and means; side talks with members that almost invariably bring new ideas; and exhibits and displays by the dental dealers that keep one in touch with the newest and best in instruments, equipment and other aids in practice. And also the social features are worthy of consideration. New scenes and a change from the humdrum of daily practice are beneficial to anyone.

Regarding the expense, what are a few dollars in comparison with the benefits just enumerated?

We can scarcely believe that any dentist is so bigoted as to think he already knows so much that he cannot learn more. Such men are to be pitied, for they are the ones who slowly but surely retrograde and get behind the times. And again, if one really does knows so much more than others, the society members need his assistance and he is not doing his duty to his profession if he is not willing to impart to others what knowledge he can. The societies need the dentists as well as the dentists need the societies.

It seems to the writer that one of the most nonsensical excuses is that one is too busy to get away. It may sometimes happen that a dentist is detained by some specially urgent or severe case, but this will occur but once in a great while. If the dentist leaves his office for a few days to attend a society meeting his patients appreciate the fact that he is progressive and is keeping up with the times, and he owes it to his patients to keep posted on the newest and best in dentistry. He will lose no desirable patients by a few days' absence, and on the other hand it may help to bring many new ones.

It is true that one can read the papers when published in the journals, which is good so far as it goes, but there are so many helpful things brought out in one way and another at the meetings that never get to the journals that one cannot estimate how much he is really missing by non-attendance.

If it is indifference on the part of the dentist that keeps him from the meetings he should wake up—lethargy and the successful practice of dentistry are as incompatible as oil and water. The dentist to be able to do the best dentistry must be progressive. "It takes a live fish to go up stream; any dead one can float down." So it is with the progress of the dentist; be a live one.

THE CHEERFUL MAN

Cheerfulness is a trait which all can cultivate and which anyone can attain. It is the one characteristic which meets its reward in this world and which is always an inward grace with an outward demonstration for good.

Chas. Kingsley said: "The men whom I have seen succeed best in life have always been cheerful and hopeful men, who went about their business with a smile on their faces and took their changes and chances of this mortal life like men, facing the rough and smooth alike as it came."

Besides the joy cheerfulness gives to its possessor, it seems to transmute daily opportunity into gold. The man who smiles, wins where the grouchy one fails, and so it is proven a great business asset. All persons are not born with the spirit of cheerfulness, but many acquire it because of its manifest spiritual and material value. And it is well worth the time it takes to make the acquisiton.

THE "Common People" are divided into three classes: Those who "didn't know it was loaded;" those who rock the boat, and those who believe that the foreigner pays the tariff.—Silent Partner.

SOCIETY·ANNOUNCEMENTS

Program of the American Medical Association, Section on Stomatology, for the Annual Session at Los Angeles, California, June 27 - 30, 1911

1. Chairman's Address, Stewart L. McCurdy, Pittsburgh, Pa.

2. Oral Development in the Progeny as Influenced by the Buccal Tissues During the State of Pregnancy, Arthur Zentler, New York City, New York.

3. The Importance of the Deciduous Teeth in the Development of the Child, M. Evangeline Jordon, Los Angeles, Cal. Discussion opened by W. W. Beckett, Los Angeles, Cal.

4. The Alteration in Shape of the Nostril From Birth to Puberty: Its Relation to Operations on the Upper Lip and Nose, T. E. Carmody, Denver, Colo.

5. Speech Defects Due to Imperfect Development Without Cleft Palate, George V. I. Brown, Milwaukee, Wis.

6. The Intimate Relation Between the Condition of the Oral Cavity and General Health, C. Deichmiller, Los Angeles, Cal.

7. Report of a Case of Osteomyelitis of the Inferior Maxilla Complicated by a Metastatic Ilio-caecal Abscess, Adolph B. Baer, San Francisco, California.

8. Report of a Case of Acute Mercurial Poisoning Followed by a General Necrosis of the Maxillæ and Suppuration of the Middle Ear, Adolph B. Baer, San Francisco, Cal.

9. Some Bacterial and Non-Bacterial Diseases, Eugene S. Talbot, Chicago, Ill.

10. A Partial Review of Some of the Recently Discussed Dental Subjects Touching Medical Fields, Eugene R. Warner, Denver, Colo.

11. The Stomatological School in the United States: Its Necessity and Possibility, Hilaire Allaeys, Anvers, Belgium.

12. (a) Report of the Committee on the Advancement of Stomatological Education.

(b) Report from the Committee on the Advancement of Stomatological Education from the American Medical Association to the Carnegie Foundation for the Advancement of Teaching, Eugene S. Talbot, Chicago; Herbert A. Potts, Chicago; Frederick B. Moorehead, Chicago.

Stewart L. McCurdy, Chairman.
Eugene S. Talbot, Secretary.

National Dental Association

The fifteenth annual session of the National Dental Association will be held in Cleveland, Ohio, July 25th to 28th and the indications are favorable for this being the best meeting the National has ever held.

Cleveland is a beautiful city, of 600,000 population, with exceptionally good rail and water transportation facilities; ample and convenient hotel accommodations; well arranged halls for meetings, clinics and exhibits, extensive and beautiful boulevards and parks, and a local Dental Society with 140 members actively engaged in making preparation for every convenience and comfort of those who may attend, which goes far in making a successful meeting.

The complete program will be published in the July Dental Journals, but will state that the Clinic Committee has given assurance that it will have some 300 clinics, and the following have been secured as essayists: Drs. S. G. Perry, New York City; R. H. Hofheinz, Rochester; C. N. Johnson, C. S. Case and Frederick B. Noyes, Chicago; Charles S. Butler and F. W. Lowe, Buffalo; Joseph Head and J. G. Lane, Philadelphia; W. R. Clack, Mason City, Iowa; E. M. Kettig, Louisville; Alfred G. Fones, Bridgeport, Conn.; George H. Wright, Boston; R. W. Bunting, Ann Arbor, Mich.; W. O. Hulick and W. H. O. McGehee, Cincinnati, and Varney E. Barnes, Cleveland.

Wednesday evening, July 26th, is to be devoted to an Oral Hygiene meeting, and Dr. Eugene H. Porter, New York State Commissioner of Health, has been invited to address this session. The Revision Committee has called a meeting for 9 a. m., July 24th, at the Hollenden Hotel, and has invited every State Society and National Dental organization to send a representative to meet with them.

Railroad rates of a fare and a half, certificate plan, will be granted.

The local committee seems confident that we should have at least 3,000 dentists in attendance and is making arrangements accordingly. When we consider the favorable conditions, as outlined, we trust its expectation may be more than realized.

The interest of yourself and clientele are BEST conserved when YOU accept every such opportunity for professional advancement; therefore, YOU cannot afford to miss this meeting. General information concerning the local arrangements can be obtained by addressing Dr. Geo. H. Wilson, Chairman, 701 Schofield Bldg., Cleveland. Hotel reservation can be made through Dr. H. C. Kenyon, 730 Rose Bldg., Cleveland.

Membership in your state dental society, or allied societies, makes you eligible to the National; membership fee $5.00. Application blanks may be secured from the secretaries of the state societies, or from Dr. Charles W. Rodgers, Cor. Sec'y, 165 Harvard St., Dor., Boston, Mass.

Homer C. Brown, Rec. Sec'y.
Edward S. Gaylord, President.

Call of Oral Hygiene Conference

The Oral Hygiene Committee of the National Dental Association hereby issues a call for a conference on Oral Hygiene, to be held in the Engineers' Building, Cleveland, Ohio, Friday, July 28th, 1911, at 8 p. m.

This Conference is called for the purpose of bringing together the Oral Hygiene workers of the country with the object of discussing suitable ways and means of handling the Oral Hygiene problem of this country in the most effective and economic manner.

The object of issuing a call for a meeting at this time and place is that the National Dental Association meets in Cleveland, O., July 25th to 28th, and the conference will be held immediately following the National Dental Association meeting.

The Committee earnestly desires that every member of the profession interested in the all-important question of Oral Hygiene make it a point to be present at this meeting.

The Oral Hygiene Committee of the National Dental Association,

W. G. EBERSOLE, *Chairman.*
E. P. DAMERON,
RICHARD GRADY,
J. P. CORLEY,
H. C. THOMPSON,
B. HOLLY SMITH,
W. A. WHITE.

Report of the Fifth International Dental Congress

In answer to numerous inquiries, I beg to announce that the first volume of the "Transactions of the Fifth International Dental Congress" is already printed, but that it will not be delivered, because of the expense of sending (something like 2,000 M) till Volume II is ready to accompany it. The delay in issuing the "Transactions" causes me as much regret as anyone, but was made inevitable by the tardy receipt of the lectures and the Section reports, which were very slow in coming in, in fact some of them have not even yet been handed in. It also took quite a good deal of time to get the illustrations ready, some of which are very superior. I hope, in spite of the fact that the published work has not been got out quite so soon as was expected, it will nevertheless meet with a cordial reception from all concerned. I furthermore trust that both volumes will have been received by all participants in the Congress by the time the Central-Verein meets, or, at the very latest, by the time of the annual session of the F. D. I. in London.

Schaeffer-Stuckert, General Secretary.

Minnesota State Dental Association

The twenty-eighth annual meeting of the Minnesota State Dental Association will convene in Masonic Temple, Minneapolis, June 9-10, 1911. Neither pains nor expense have been spared to make this the largest session in the history of our association.

Dr. C. N. Johnson, of Chicago, will present a paper on "Care of Children's Teeth," and Dr. W. H. G. Logan, of Chicago, will give a stereopticon lecture entitled, "The Diagnosis Treatment and Prognosis of Phagedenic Pericemental Alveolitis."

In addition there will be chair clinics to the number of thirty, supplemented by a large table clinic, in which well known members of our profession from Minnesota, Iowa, Wisconsin, North and South Dakota will participate.

An extensive manufacturers' exhibit will also be another feature. All ethical men are cordially invited to attend. Benjamin Sandy, Sec'y, 827 Andrus Bldg., Minneapolis, Minn.

Southern California Association

The fourteenth annual meeting of the Southern California Dental Association will be held in Los Angeles, June 27th to the 29th, 1911, the session of the Stomatological Section of the American Medical Association being held here on the same dates. Both meetings convene at the College of Dentistry, located at Fifth and Wall streets. The profession throughout the country is most cordially invited to join with us in the enjoyment of these important meetings. B. Frank Gray, Chairman Publicity Committee, So. Cal. Dental Association.

Wyoming Board of Dental Examiners

The Wyoming board of Dental Examiners will meet to hold examinations at Cheyenne, Wyo., on the 6th, 7th and 8th of July, 1911. Applications for examinations must be in the hands of the secretary fifteen days before the meeting of the board, together with the fee of $25.00. For further information address Peter Appel, Jr., Secretary, Cheyenne, Wyo.

Wisconsin State Society

The forty-first annual meeting of the Wisconsin State Dental Society will be held at Eau Clair, Wis., July 11, 12, 13. All ethical members of the profession are cordially invited. O. G. Krause, Sec'y.

Utah State Dental Society

The Utah State Dental Society will have its twentieth annual meeting at the Commercial club in Salt Lake City on June 23 and 24th. W. G. Dalrymple, Secretary.

THE DENTAL SUMMARY

The Magazine That Helps

Vol. XXXI JULY, 1911 **No. 7**

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The Ohio State Dental Society
The Michigan State Dental Society
The Indiana State Dental Society
The Kentucky State Dental Society
The Louisiana State Dental Society
The West Virginia State Dental Society
The Northern Ohio Dental Society
The Northern Indiana Dental Association
The Eastern Indiana Dental Society
The Southwestern Michigan Dental Society
Odontological Society of Western Pennsylvania
The Lake Erie Dental Society

and Several Local Dental Societies

Editorial Office; 1255 Neil Avenue, Columbus, Ohio
L. P. Bethel, M. D., D. D. S., Editor-in Chief

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REGULAR CONTRIBUTIONS

SOME SUGGESTIONS ON THE BAR EXTENSION FOR RETENTION OF DENTURES.

By E. C. Mills, D. D. S., Columbus, Ohio.

THE above system, as advocated by the writer in articles appearing in The Dental Summary of January, 1910, and May, 1911, has awakened some interest in this subject, judging from the letters of inquiry that have been received from various sections. As a matter of economy of time and convenience, a few general suggestions may suffice for personal replies to these inquiries.

In describing the technic of this method of retention it seemed unnecessary to enter into the details of packing and vulcanizing to prevent having a porous plate, or the importance of putting the mouth in a condition, which, in the opinion of the operator, seemed best to meet the requirements of the case. The retention of a loose tilted molar, roots, etc., in fact, any useless teeth that will interfere with the accurate and easy adjustment of the denture, should not be countenanced if satisfactory results are expected. The confidence and co-operation of the patient are essentials to success in any dental work, for without these, long chances are taken in regard to attaining success. The possibility of the patient's refusal to have the caps cemented to the teeth, owing to the bars being attached, did not occur to the writer. Such a case in which the patient was permitted to wear these caps uncemented shows the perfunctory manner in which some operators are taking hold of this system.

"Short cuts" in the technic heretofore described are admissible, providing the results are satisfactory; but time must not be economized at the expense of attention to details. Having so strongly advocated the use of the bar, the writer feels some share in the responsibility as to the success, and in justice to himself desires to add that some disappointments were experienced before becoming fully satisfied with its merits.

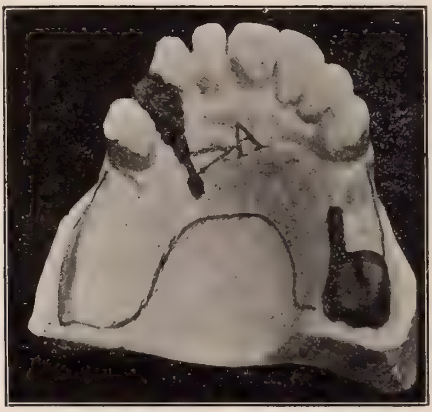

Fig. 1.

As to the form of the bar—a square one has a three-surface contact with the vulcanite and permits of no turning in the slot or receptacle; on the contrary a round bar cannot be imbedded and have surface contact to a depth greater than one-half its diameter, and its receptacle in the vulcanite can be no more than a shallow, half round groove; therefore, in case of a bridge, or plate on one side only, the only possible resistance to turning or rocking on this support would be bending its ends at an angle.

This method of using a round bar, in connection with one of the attachments now on the market, has been practiced in the clinic of one of our dental colleges and was attended with varying success, due to the metal of the attachment losing its resilience from the stress of mastication, as well as the removal and replacing of the denture. The use of a square iridio-platinum bar, 15 gauge, would obviate this difficulty, because even after this attachment we can rely upon the friction of the bar.

If conditions seem to require a firmer fixation than the friction of bar in the vulcanite, a clasp may be employed to engage the bar in the groove, rounding the bar where it is clasped as shown in Figure 1, between the lines extending to A. This figure represents a case where the upper right molars and left bicuspids were restored. The first upper right bicuspid, being badly broken down, was capped, and a bar attached, extending as shown. The upper left molar was also capped and a bar of double thickness, to afford deeper anchorage in the vulcanite, placed as represented. Figure 2 illustrates the upper surface of the plate, showing the receptacles for the bars; the one extending from the upper right bicuspid contains the clasp, the jaws of which were touched up with whiting for convenience of photographing. This clasp, a vertical section of which is shown in the plate in diagram Fig. 3, is constructed of thin clasp metal, made to easily engage the bar at its rounded portion, and then soldered to a piece of plate of sufficient size to reinforce the plate at this point; a precaution necessary owing to the thinness of the palatine portion of the vulcanite. After investing the case, the clasp is placed in its proper position on the bar, coating its inner surface with plaster to exclude the rubber while vulcanizing. To obviate its displacement during this process, the corners of the plate to which it is attached, can be cut as to provide supports to rest upon the cast. After vulcanizing trim out a small portion of the vulcanite, about the jaws of the clasp, so as to permit its opening to engage the bar.

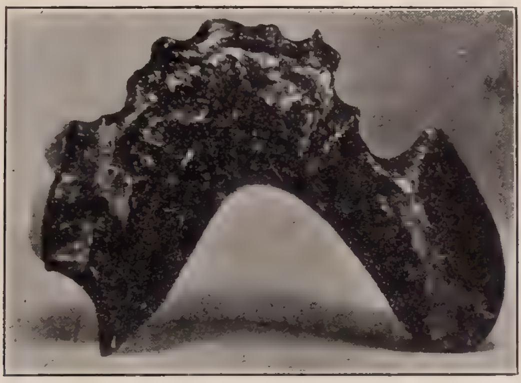

Fig. 2.

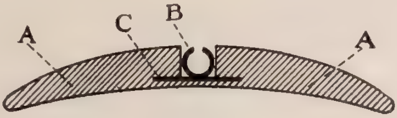

Fig 3.

A—Cross section of plate.
B—Clasp.
C—Plate to which clasp is soldered.

In all cases of bar retention, it has been the practice of the writer, when possible, to permit the patient to wear the denture with the caps for a day before cementing to place, believing this method affords greater accuracy in getting the parts in their relative positions.

REMARKABLE CASE OF ATROPHY OF THE TEETH IN A CHILD OF TWELVE YEARS.

By William C. Stillson, D. D. S., Cleveland, Ohio.

BUT few conditions within the scope of dental pathology are more interesting than that of atrophy or hypoplasia of the teeth. In the report of this case I will endeavor first to describe conditions as they are found; second, point out the cause as nearly as possible from what history could be obtained; and third, mention and describe some of the secondary pathological changes occurring in the same mouth which followed closely in the path of the primary condition of atrophy.

From the illustration (Fig. 1) it will be noted that the incisal two-thirds of the crowns of the upper incisors, laterals and cuspids, has been removed by mechanical abrasion. The enamel upon the remaining portion of the crowns is very thin and pitted, and caries can be found upon the labial surfaces of the left cuspid and lateral and upon the mesial surface of the right central incisor. The carious areas are black and seem to have progressed very slowly. When looking squarely at the abraded surfaces, occasionally caries can be seen advancing slowly along the line of the dento-enamel junction. The dentine upon the abraded surfaces has the characteristic translucent polished appearance usually found under these conditions, and is of a very deep brown color. In fact, the dentine when exposed upon any surface of any tooth in the mouth, presents the same deep brown color.

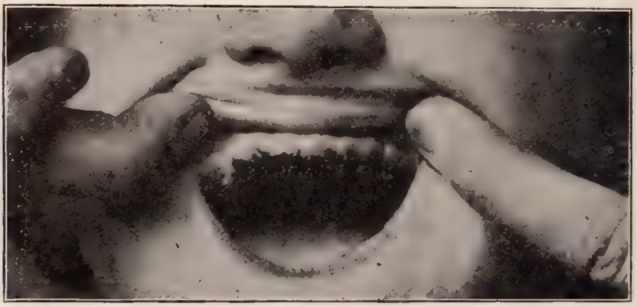

Fig. 1.

The upper bicuspids present a peculiar appearance due to their lack of enamel. Atrophy of the dentine is here evident because of the small size of the crowns. The only enamel to be found on the surfaces of these bicuspids is a small strip through the sulcus of each tooth, a small nodule upon the point of each cusp and a thin band completely surrounding the gingival third of the crowns. The dentine exposed between the occlusal surface and the gingival third of the crowns is of a translucent brown color. No caries appears upon the upper bicuspids, and very slight abrasion.

The upper right first molar has been badly destroyed by caries and little more than the roots remain. The small mesial portion of the crown still intact presents no enamel. The upper left first molar was extracted one year before the case was seen, but one root was left. The upper second molars are not entirely erupted. That portion of the crowns which is erupted presents the typical appearance of atrophy so common in the first molars in milder cases. The points of the cusps are represented by small nodules of enamel. No decay is as yet present, but the gnarled and knotted enamel over the occlusal surface is characteristic of atrophy in the first molars, which had been due to some injury occurring at the time of birth. From what could be seen of these teeth, it would be judged that at least the gingival three-fourths of the crowns is in a healthy normal condition.

The lower incisors and laterals (Fig. 2) show far more disastrous results of mechanical abrasion than the upper, and their crowns have been worn away to the gums. No caries is present upon any of the surfaces of the lower teeth. The abraded surfaces have a polished appearance and no enamel whatever can be found upon the lower laterals and centrals. In the center of these roots a small transparent spot represents the former position of the pulp, secondary dentine having been deposited. The lower cuspids are not abraded quite to the gums, and a small band of thin enamel can be located near the gingival line.

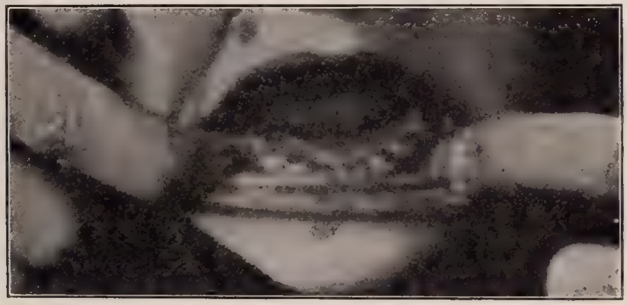

Fig. 2.

The lower bicuspids quite resemble the upper ones. No enamel can be located except upon the occlusal surface and a thin band around the gingival third of the crowns. Small nodules of enamel represent the points of the cusps. Those surfaces which occlude with the upper teeth are badly abraded. The dentine has the translucent opaque appearance of that of the upper bicuspids.

The lower first molars have been extracted. The lower left second molar has not erupted and the accompanying skiagraph (Fig. 4), shows this tooth about to erupt. The lower right second molar is not entirely through the gums. The small portion of the crown which does appear, presents the characteristic atrophied form of the first molars in milder forms of this condition.

A slight abnormality of the gums can also be noticed (Fig. 3). They are not anemic, neither are they engorged with blood, but the free gum margin presents a slight appearance of hypertrophy. This is especially noticeable in the gums over the labial, buccal and lingual surfaces of the teeth. The skiagraph (Fig. 4) shows that the roots are in normal condition.

The case under consideration is that of a girl twelve and one-half years old. Her general physical condition is excellent. The teeth of her parents are normal. She has a younger brother and sister, both in normal physical condition and neither showing any deformities of the teeth whatever. No history of any disorders before the third year of life could be obtained. The child was breast fed and the digestion was in no way impaired so far as could be ascertained. The mother at the time was in a healthy condition, being neither tubercular nor anemic. At three years of age the patient suffered with whooping cough, and between the sixth and seventh year was obliged to give up school work part of a term because of an attack of scarlet fever with a slight touch of diphtheria. Aside from this no history of any disorders whatever can be obtained.

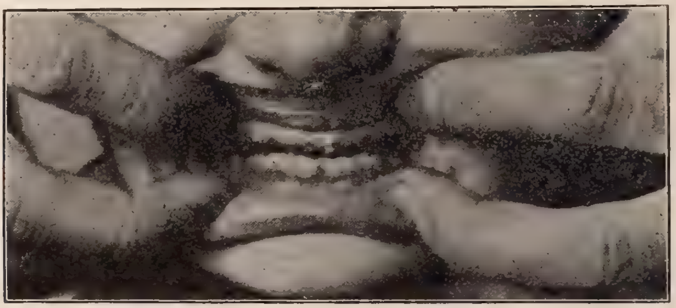

Fig. 3.

Of all the teeth in the mouth of the patient the second molars seem to offer the only key to the etiology. In these the occlusal fourth of the crowns is atrophied, and since the time of calcification of this portion of the crowns of the second molars is about the sixth or seventh year, we may be reasonably sure that the interference in nutrition occurred about this time. This points immediately to the period at which the patient suffered with scarlet fever with a slight touch of diphtheria. Working, then, upon this theory we must assume that the bicuspids calcified a little before the normal time, since so much of their crowns is involved. Ordinarily little more than the occlusal thirds of the crowns of the bicuspids are calcified at the sixth year.

Little remains of the first molars to tell their condition at the time of eruption. It is certain they were early victims of caries. Little also remains of the incisors, laterals and cuspids. They were the early victims of abrasion. If no disturbance in nutrition had taken place before the sixth year, we would expect to find the crowns of the central and lateral incisors, and the incisal half of the crowns of the cuspids, entirely and normally calcified. These could not have been perfectly calcified in the case under consideration, since they were so easily abraded. We are forced to conclude then that the atrophied condition of the anterior teeth and the first molars, must have been due to some disturbance in physical conditions before the sixth year. As we have no history of anything other than whooping cough at three years, it may be possible this was the source of the derangement in the centrals, laterals, cuspids and first molars. Aside from this the cause is a mere matter of conjecture, but there must have been some derangement in the child's nutrition during the first three years of life.

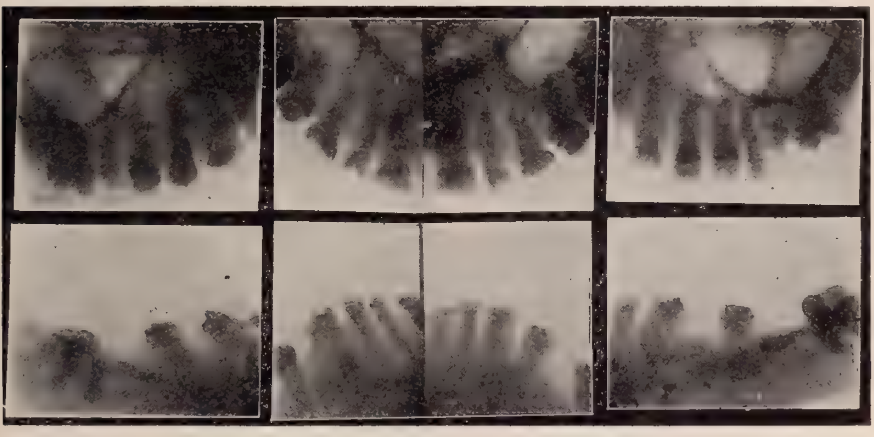

Fig. 4.

As to the secondary pathological changes which have followed the condition of atrophy, the first to appear was undoubtedly caries. If the first molars erupted in a badly atrophied condition, the imperfect structure of the enamel would make them an easy prey to caries. The slow progress made by the decayed areas upon the anterior teeth is probably due to the fact that they were freely open to the fluids of the mouth. Aside from a very few small cavities, the mouth seems at present to be immune to caries. This immunity at the present time is evidently due to the exposed surfaces of the teeth being scoured by the food in mastication. The slight decay which is found is progressing in protected areas.

The second interesting condition is that of mechanical abrasion, especially so because of the age of the patient. Atrophy of the enamel apparently accompanied by interglobular spaces in the dentine was the primary condition. This permitted abrasion of the teeth to proceed so rapidly as to out-distance the ravages of caries. Along with this, of course, has been the depositing of secondary dentine, which has almost entirely filled the canals of the anterior teeth, and has been rapid enough to prevent exposure of the pulps. The effects of abrasion are more marked in the lower teeth probably because they were erupted previous to the upper, or possibly it was due to the relative size of the surfaces exposed to wear in the upper and lower teeth.

The third pathological change deserving note is that of the slight hypertrophied gingivæ, especially over the labial, buccal and lingual surfaces of the teeth. This has been undoubtedly caused by the constant pressure of the food in mastication upon this tissue, the normal protecting contours of the crowns having been destroyed.

A SECTIONAL IMPRESSION FOR DIFFICULT CASES.

By D. W. Barker, M. D. S., Brooklyn, N. Y.

Probably the most difficult cases are those where one or two teeth have been lost on either side with much absorption of the alveolar process and the remaining teeth elongated. The sectional impression overcomes the difficulties very nicely. I will suppose a case having lost the lower incisors, a left molar and bicuspid, and a right molar, with the posterior molars tipping forward. A small mass of modelling compound is pressed with the fingers into each space and held until stiff, but not entirely hard; it is then withdrawn to make sure it will come out and then replaced; these pieces should slightly overlap the adjoining teeth; then a fourth and fifth piece of compound is pressed between and overlapping the first three pieces; the first being hard it will not unite to them. On withdrawing the five pieces it will be found easy to put them together and a correct model obtained. No tray is used.

PRACTICAL HINTS.

By C. H. Chamberlain, D. D. S., Randagh, Can.

In carving cusps for swaged shell crown, make band, contour and fill with "Moldine" (clay), carve cusps with wax spatula, dust with lycopodium powder, take an impression of cusps with dental lac and swage 32-gauge gold into lac, using Coates' cusp swager. Trim and fill with solder.

In casting solid gold dummies, select suitable vulcanite tooth, dust Moldine with lycopodium and press tooth into it; remove, warm inlay wax over flame and press gently into clay impression. Remove wax, trim and invest for casting.

PENDULUM SWING.

By C. R. Butler, M. D., D. D. S., Cleveland, Ohio.

I DON'T know much about the swing of the pendulum. I have, however, seen the old swinging lamp in the cathedral at Pisa that gave Galileo the cue for the pendulum for the clock. But I do know something about the swing of the hand mallet as an efficient instrument to pack gold in filling teeth.

In the December, 1910, *Cosmos* editorial, an attempt is made to show that machine mallet is superior to hand mallet work. I grant for speed and ease to the operator, that to be a fact, but for teeth saving—nay, verily. We will quote only two examples—Webb and Bonwill—acknowledged experts in the use of electro-magnetic and engine mallet. The speed of the blow in the electro-magnetic gave a vibration to the plugger point, so that it was a physical impossibility to carry it safely into a narrow crevice or along thin margins.

I made careful examination of fillings with a magnifying glass, and they showed more or less damage along the enamel margins. And I made slight use of these mallets under the instruction of Dr. Bonwill, but became satisfied that I could not put the plugger point with the precision required for safe borders. The trip and steam hammer for rapid forging is not to be questioned, but for delicate work the hammer in the hands of a skilful workman has not been equaled or excelled by any machine.

The variety of percussive force demanded in packing gold that is tolerable to the patient, and safe for the tooth, cannot be secured always through an assistant, as when an expert operator has the mallet in his own hand.

All machine and automatic mallets must work in straight lines; the plugger cannot be pressed laterally, as it can be when the impact blow is given with the hand mallet (only to a slight degree).

The change from a heavy to a light stroke, which is so often required, cannot be obtained in a machine mallet as with the hand. And a dentist that depends on the machine mallet and automatic for packing gold never becomes an expert in hand force operating.

The great majority of modern dentists have never provided themselves with suitable hand pluggers. Some style of machine or mechanical instrument is the rule.

One quail of Dr. Southwell species doesn't make a flock. Bonwill and Webb strove hard to convince dentists that their mechanical mode of inserting gold fillings was superior to Palmer, Varney and a host of other faithful operators.

Dr. Ebenezer Merrit in 1830 used the hand mallet to condense gold in filling teeth, and the writer is of the opinion that its use will be favorably considered so long as cohesive gold is used for filling cavities in teeth.

We have been taught that there is only one way under heaven to "save souls." But clinical experience teaches that teeth may be saved in more ways than one. The pendulum may continue to swing, but the majority of patients will not prefer to have machine operations.

The dental engine, however, to drive the cutter, is all right, but the hand excavator cannot be safely laid aside any more than the scalpel by the skilful surgeon.

ANATOMICALLY ARTICULATING ARTIFICIAL DENTURES.*

By George Wood Clapp, D. D. S., New York.

THE mechanical steps may be enumerated under four headings as follows:

1. MAKING THE TRIAL PLATES.

Secure a good plaster model of each jaw.

Shape a base of base-plate gutta percha over each and trim as for a gold base.

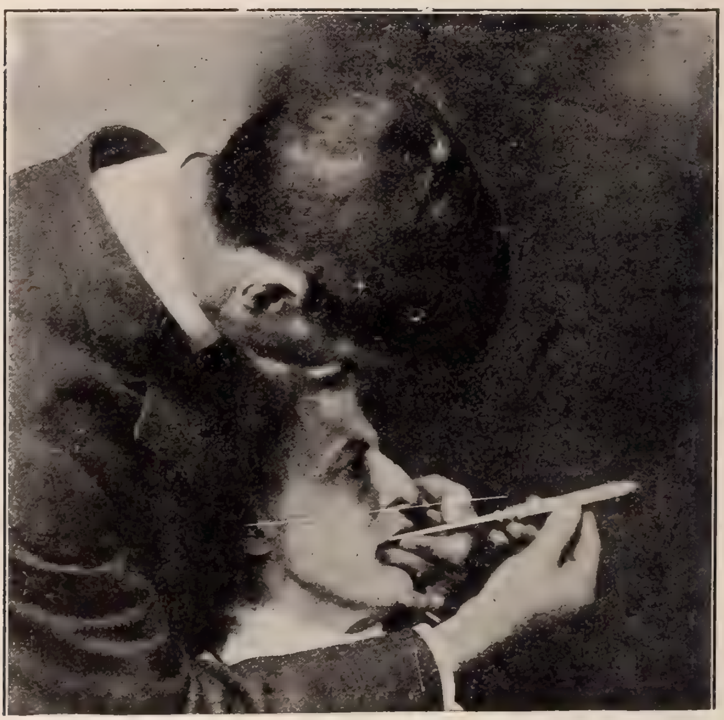

Fig. 1.—Making pressure on the knife blade to bring it parallel with the line on the face. This determines the occlusal plane of the bites.

With a ruler and a soft pencil, mark on the side of the patient's face a line from the lowest point of the external auditory meatus to the lowest point of the wing of the nose. This is the "occlusal plane" and the occlusal surface of the upper trial-plate must be made parallel with it.

Lay within reach, near the patient, a silver case-knife.

Adapt a roll of soft wax to the ridge of the upper base-plate. The base-plate with the wax ridge attached will be hereafter spoken of as the "trial-plate." Support in the mouth with the third finger of the left hand; lay

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*Given as a clinic at Indiana State Dental Society, 1910.

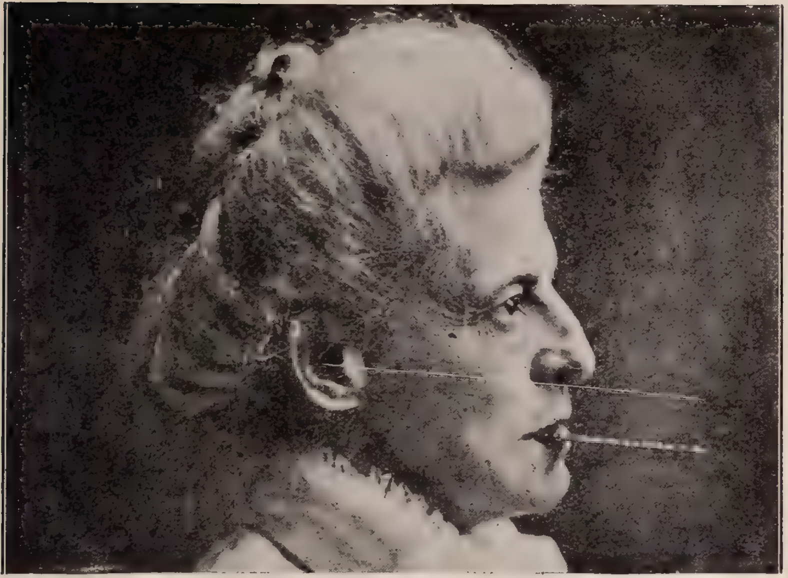


Fig. 2.—Occlusal planes of bites established parallel with line from lower margin of auditory meatus to lower margin of ala of nose. Blade of knife held between bites; handle projecting.

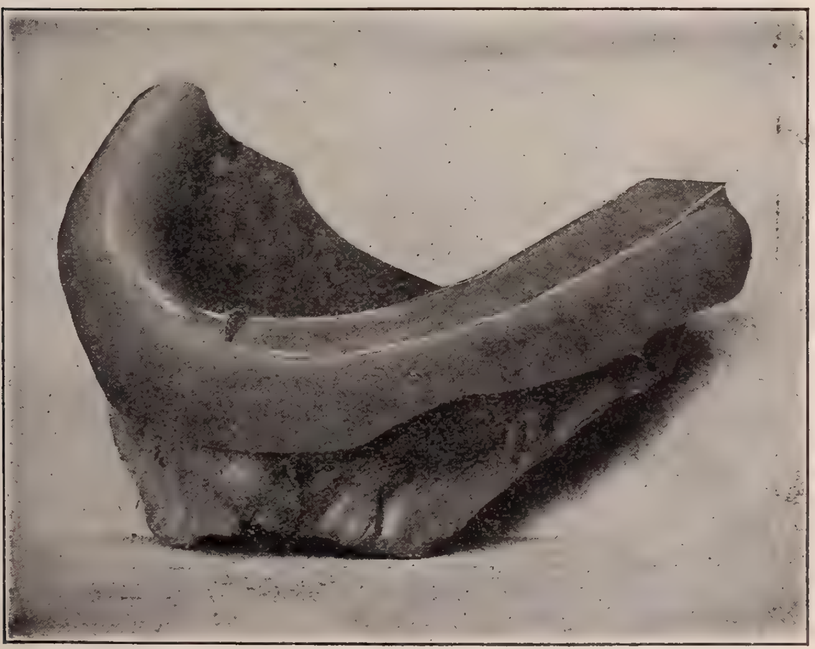


Fig. 3.—Upper trial plate (inverted) with the proper occlusal plane established on one side.

the blade of the case-knife from the heel forward, on the occlusal surface of the right hand side of the trial-plate, supporting it by pressure of the first and second fingers of the left hand. With the right hand move the handle of the knife until it is parallel with the line on the side of the face. This will shape the surface of the wax ridge on the right side, parallel with that line. By the eye, trim the other half of the ridge of the upper trial-plate to the same occlusal plane.

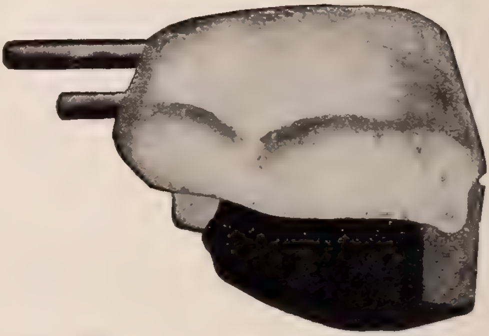


Fig. 4.—Section of an upper trial plate at the median line, trimmed labially and occlusally as required for the case in which it was used. Shows form of ridge.

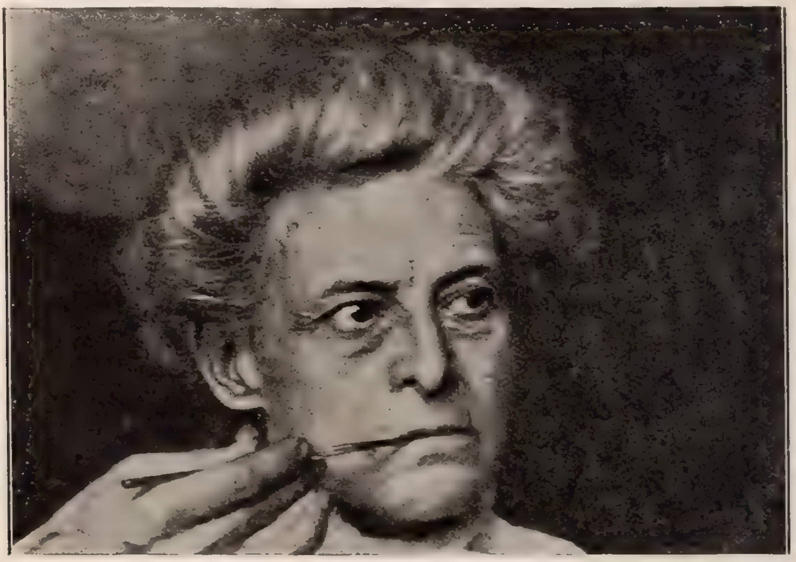


Fig. 5.—Marking the "rest line."

Trim the ridge of the upper trial-plate until it is about a millimeter and a half, 1-16 in., longer vertically in the median line, than the upper lip at rest. Replace the trial-plate in the mouth.

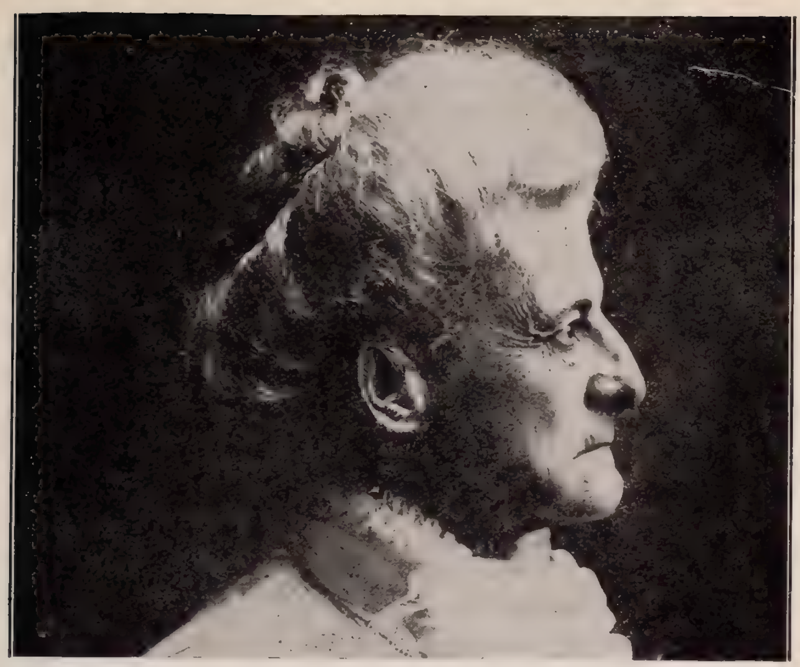


Fig. 6.—Edentulous patient seen from the side. The sinking of the lips as well as the vertical droop is here clearly seen, especially at the corner of the orifice of the mouth. (This picture and No. 8 were taken in the same light and at nearly the same time. They illustrate the necessity for and possibility of restoration.)

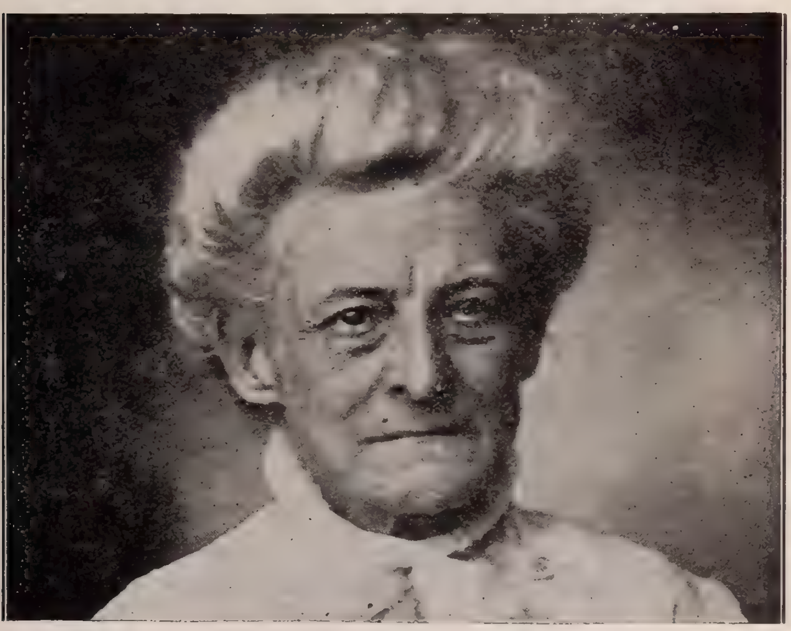


Fig. 7.—Edentulous patient showing drooping of soft tissues following extraction of teeth. The labial ends of the alæ and septum droop and the tissues in the labial triangle sink inward. (This picture and No. 21 were taken in the same light at the same time, and illustrate very clearly the possibilities in restoration.)

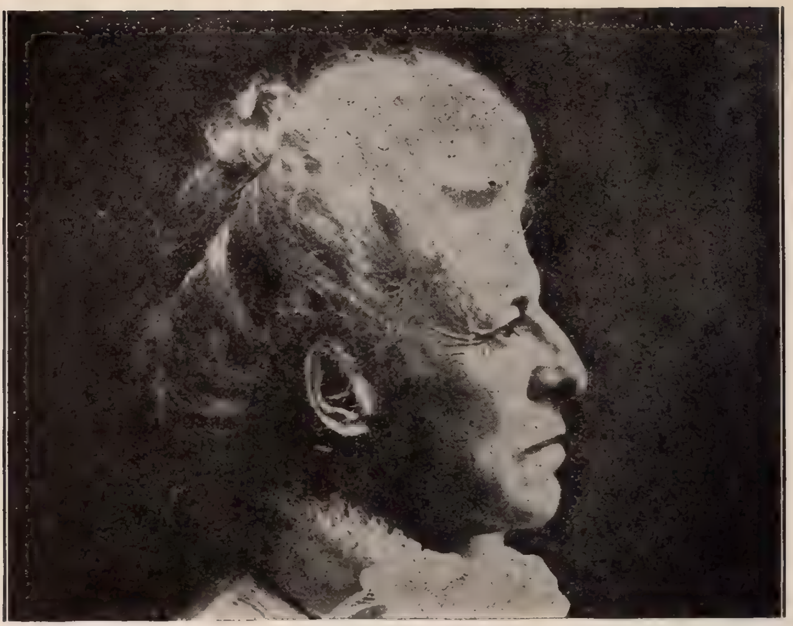


Fig. 8.—Patient with bites in position. The labial ends of the alæ and septum are pushed up to place, vivifying the expression. The lips are built out in harmony with the general facial contour. Note how much more animated and vigorous the expression is than in No. 17.

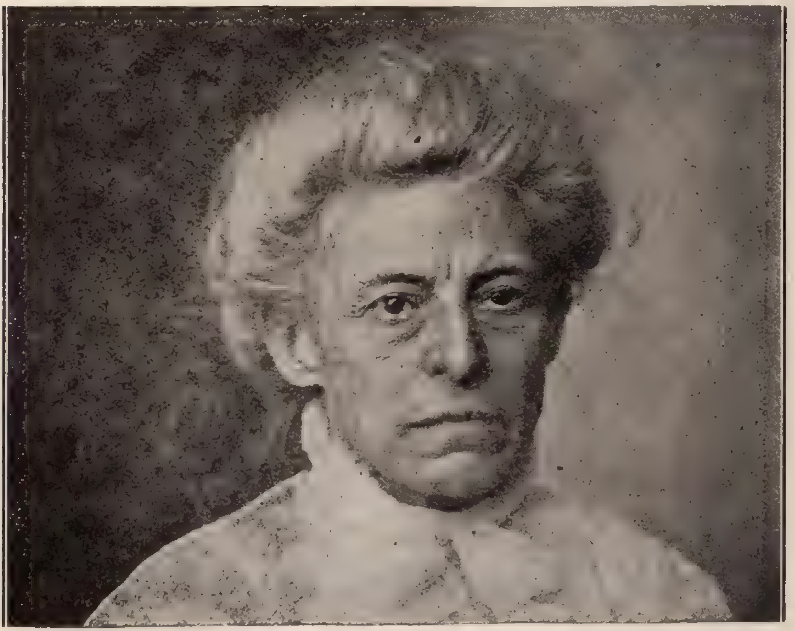


Fig. 9.—Patient with trial plates properly built up and out as in Ill. No. 10. The tissues in the labial triangle, the alæ and septum, and the corners of the orifice of the mouth have been lifted by making the plate high over the cuspid eminence. Contrast the appearance here and in No. 7.

Attach a roll of soft wax to the ridge of the lower base-plate in a similar manner, making a lower trial-plate. Place it in the mouth. Have the patient bite the jaws together until the lips touch lightly in repose. This will give the proper combined height for the trial-plates, and the correct proportionate height for each. The cold and hard upper trial-plate will shape the occlusal surface of the lower trial-plate to its proper plane.

Mark the labial surfaces of the wax ridges for the sizes of the teeth.

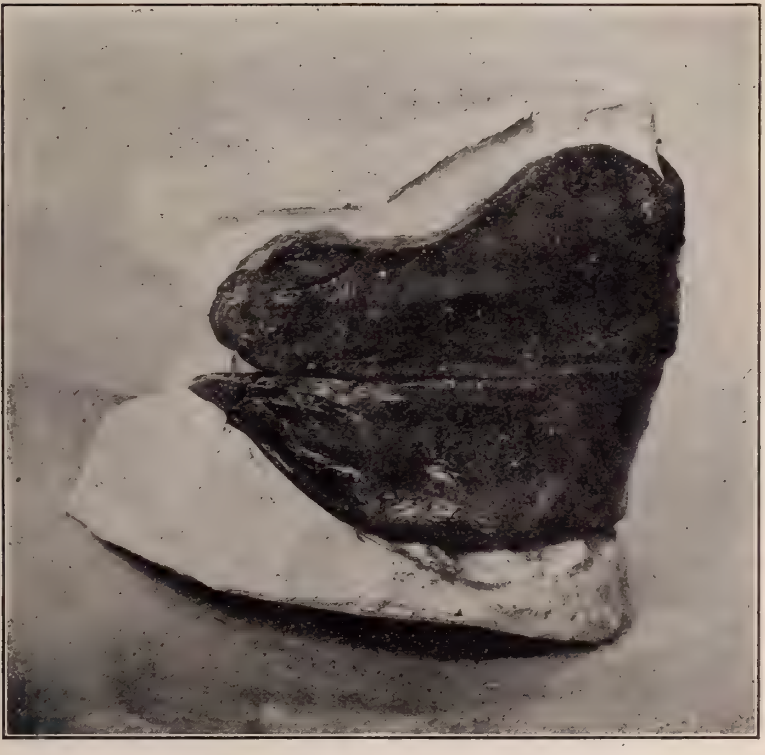


Fig. 10.—Upper and lower trial plates with occlusal plane properly established and built out labially and buccally to give proper expression. The upper is as high over the cuspid eminence as can be worn and lifts the tissues, as in Illustrations 6 and 7.

Select the mould number by the Twentieth Century Method and lay the teeth aside until ready for use.

Have the patient bite both jaws together in proper relations and make continuous scores across the buccal sides of both trial-plates in at least two places.

Remove the trial-plates from the mouth; put on the models; place together in right relations. Seal together with a hot spatula.

2. GETTING THE CONDYLE PATHS.

Locate on the side of the patient's face the head of each condyle and make a plainly visible mark over it.

Heat the mouth-piece of the face-bow and insert in the upper trial-plate in proper position. Put trial-plates, fastened together with mouth-piece attached, into the mouth. Adapt the face-bow. Lock the bow and mouth-piece together, and remove all from the face and mouth.

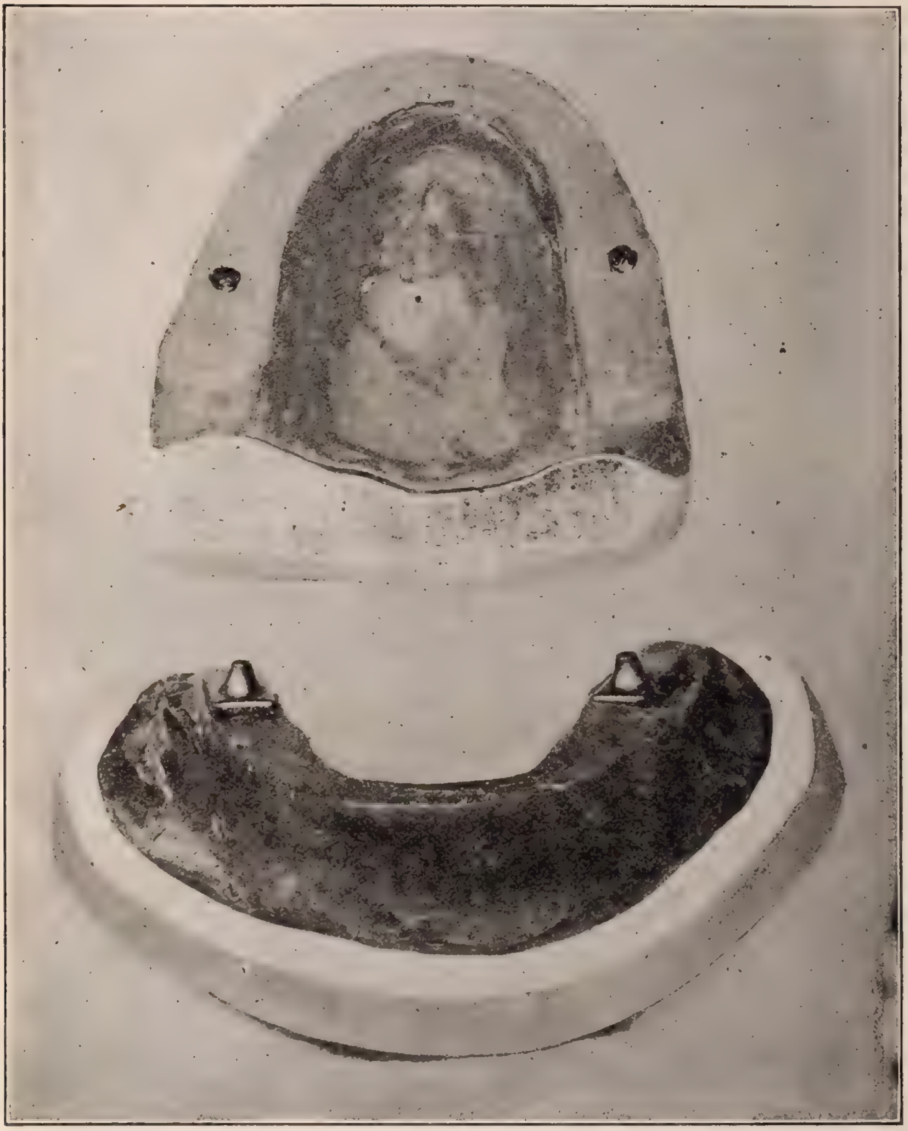


Fig. 11.—Lower trial plate with ''bite plates'' in proper position. Upper trial plate showing holes made by cones of ''bite gauges'' when protruded bite is taken.

Set the model bows of the articulator parallel by means of the set-screw. With the articulator setting upright, slip recesses in heads of the sliding pointers of the face-bow over pins on the joints of the articulator.

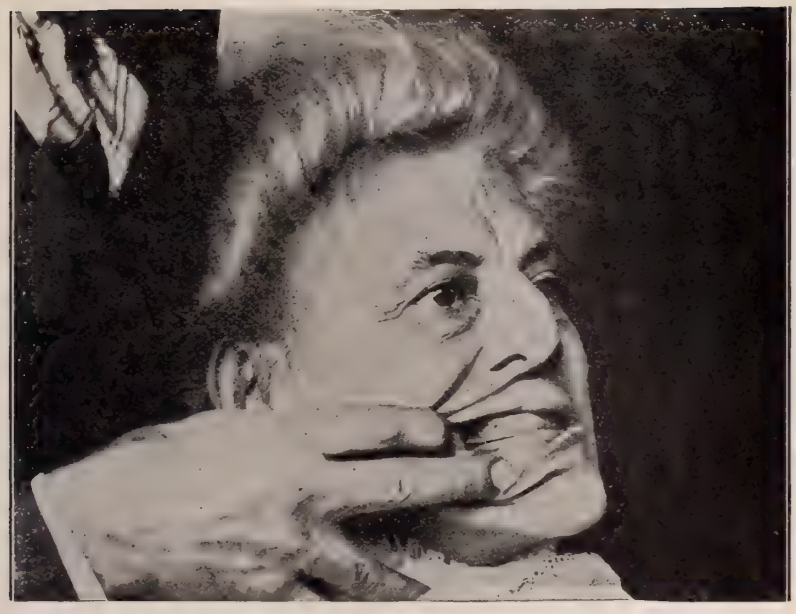


Fig. 12.—Getting the protruded bite. The separator between trial plates at heels, as recorded and maintained by the "bite gauges," is clearly shown.

Move the face-bow up and down until the mouth-piece and the lower model bow are parallel.

Prop in that position and put upper model in upper trial-plate. Push the sleeve on the upper model bow back against the articulator frame and attach the model to the bow in the usual way, enclosing the forward end of the sleeve in the plaster. Invert the articulator, face-bow and trial-plates; attach the lower model in the usual way, carrying plaster up about

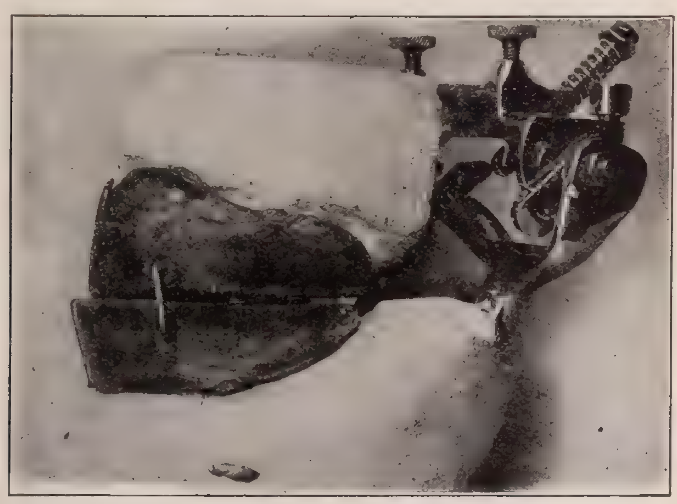


Fig. 13.—Side view of trial plates following taking of protruded bite.

the base of the articulator frame. Before the plaster is too hard, cut out the center of the lower model.

Mount the bite gauges in the occlusal surface of the lower trial-plate.

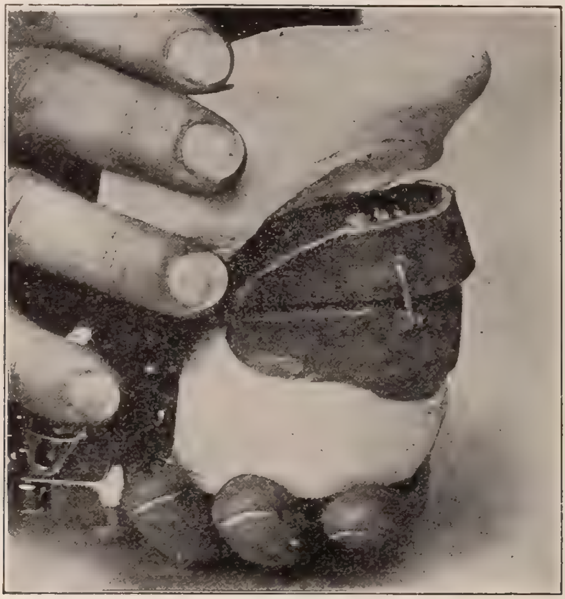


Fig. 14.—Adjusting the inclinations of the condyle slots by placing the lower model in the lower bite.

Put both trial-plates into the mouth. Have the patient protrude lower jaw and bite until trial-plates come in contact in front. Fasten together with staples at region of cuspids, and seal together on the lingual sides. Loosen the set-screws governing the movements of the condyle slots. Mount upper trial-plates, with lower trial-plate attached, on the upper model, and seal

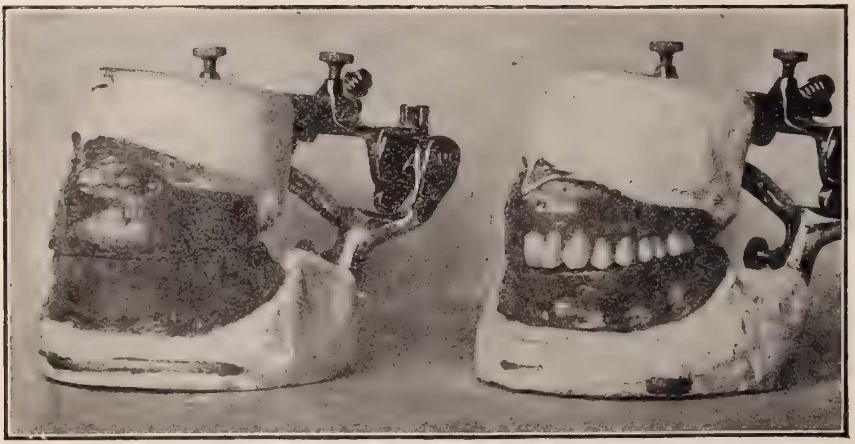


Fig. 15.—On the left: wax trial plates, curves worked out, ready for setting teeth. On the right: half of upper ridge cut away and teeth set.

fast. Adapt lower model to rest quietly in lower trial-plate and lock the set-screws and condyle paths in the slant which permits this position of the model. Remove staples and bite gauges, engage the spring on the back of the articulator.

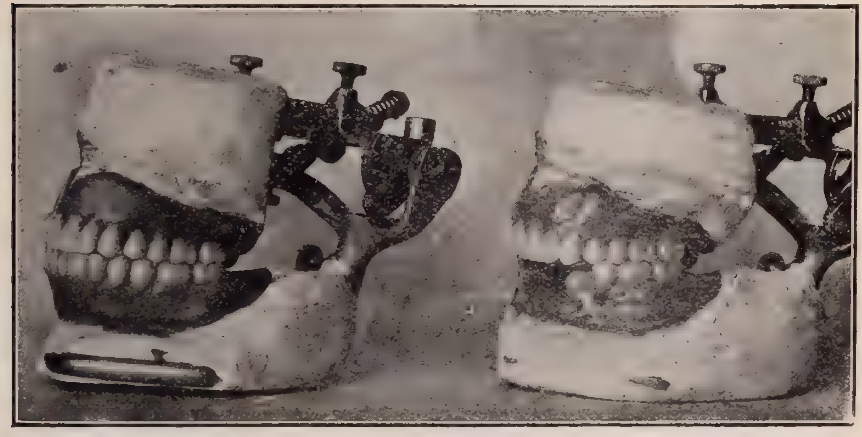


Fig. 16.—On the right: upper set all in place; half of lower ridge cut away and lower teeth partly set. On the left: both sets set; both plates vulcanized and remounted on articulator for grinding.

3. CARVING THE COMPENSATING CURVES.

Dust white powder on the occlusal surface of the lower trial-plate. Move the upper trial-plate laterally on lower, and carve. Attach a conical roll of wax to heel of lower trial-plate. Pull the upper model to that side one-eighth inch and close till trial-plates are in contact on the opposite side. Trim away the excess buccally and lingually. Carry the slope of

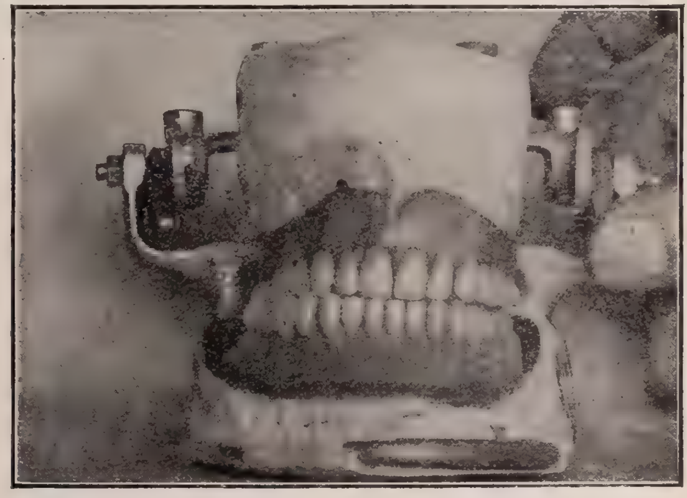


Fig. 17.—Anatomical articulation in lateral excursion of the mandible. Note form of contact on both sides.

the flattened roll into the occlusal surface of the lower trial-plate at cuspid. Trim upper trial-plate to fit lower all around when in central occlusion. Repeat once or twice, until the heels remain in contact during lateral motion toward that side. Build the other side in the same manner.

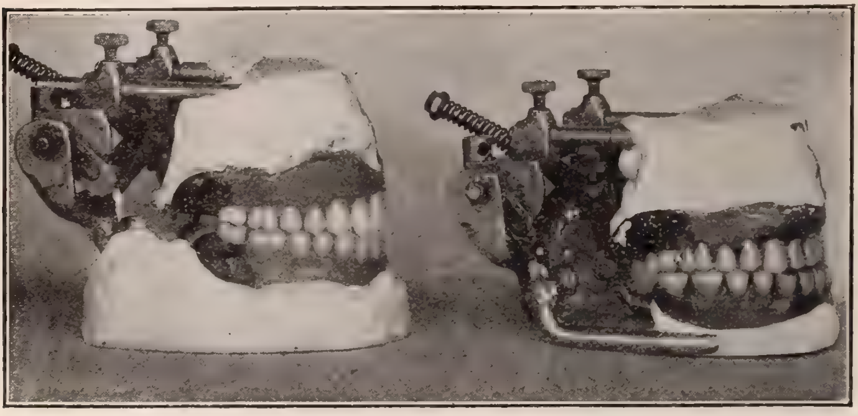


Fig. 18.—On the right: dentures made on a plain line articulator. They were set with flat occlusal planes for a patient having a condyle path inclined 50 degrees. On the left: dentures anatomically articulated with the compensating curve required for the case.

4. ARTICULATING THE TEETH.

Cut away half of the upper trialplate. Set half of upper set of teeth, beginning with the central. Set occlusal surface of bicuspids and molars against occlusal surface of lower trial-plate, as carved. Either purchase the anatomical moulds which permit this or grind the teeth until it is possible. Wax the teeth firmly in position. Set the other half of the upper set beginning with the central. By lateral movements of the upper model,

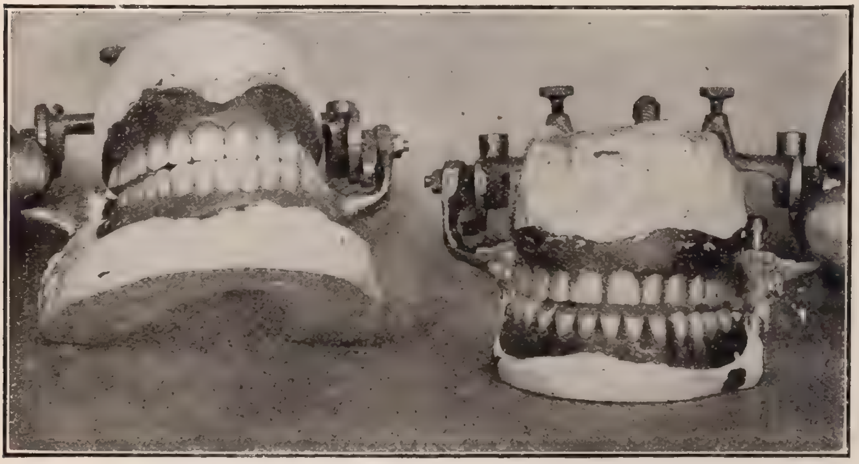


Fig. 19.—Same dentures as shown in previous illustration. Here thrown into lateral occlusion. The one on the left is tilted to show balancing contact of right molars. Notice separation between left molars in dentures on right hand.

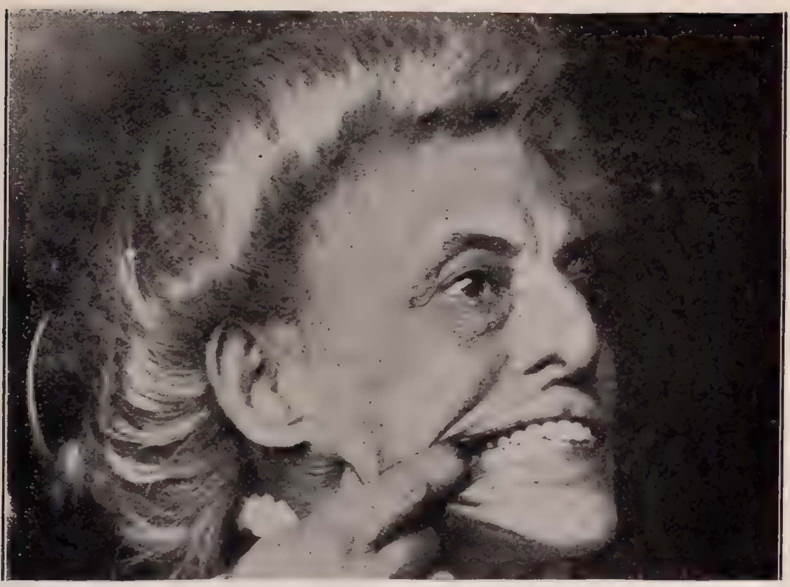


Fig. 20.—Artificial dentures in place. The mandible is here thrown to the right, bringing the buccal cusps of both sets into the same vertical plane and interdigitating them. This relation is necessary for mastication and the proper support of the dentures.

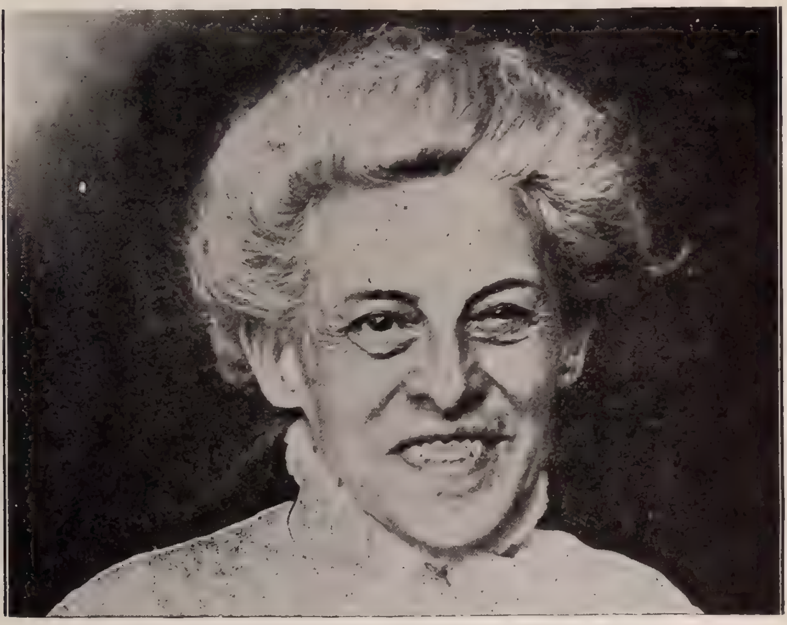


Fig. 21.—Artificial dentures in place. Teeth selected by the methods suggested in the text.

make sure that the buccal and lingual cusps follow the occlusal surface of the lower trial-plate properly in lateral and biting movements.

Cut away half of the lower trial-plate. Set lower first molar, second molar, second bicuspid and first bicuspid on one side in the order here named. Do the same on the other side. Fill in the anteriors to articulate properly and give natural effect. Perfect articulation as far as possible without grinding.

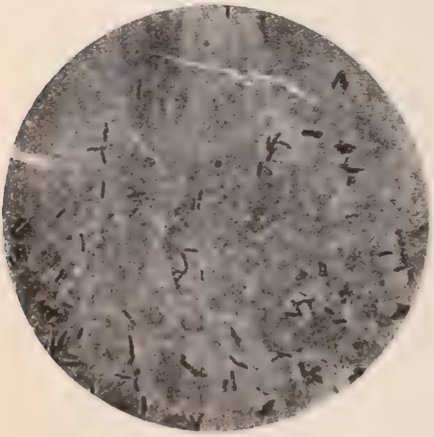
Try the articulated teeth in the mouth. Replace the lower plate on the articulator. Detach the upper model and vulcanize the upper plate in the usual way. After vulcanizing, articulate the upper plate with the lower, which is still on the articulator, and again attach the upper to the model bow in that position. Vulcanize the lower plate; articulate it with the upper plate and attach to the lower model bow. Place a paste of carborundum powder and oil on the occlusal surfaces of the teeth, press the plates together and move them through all the movements possible to masticating and biting.

For partial dentures, work out the trial-plates to the best possible articulation with the opposing teeth and set the artificial teeth accordingly. For bridges, work out models exactly as for partial dentures. Shape occlusal surfaces of dummies so as to avoid destructive or undue lateral strains.

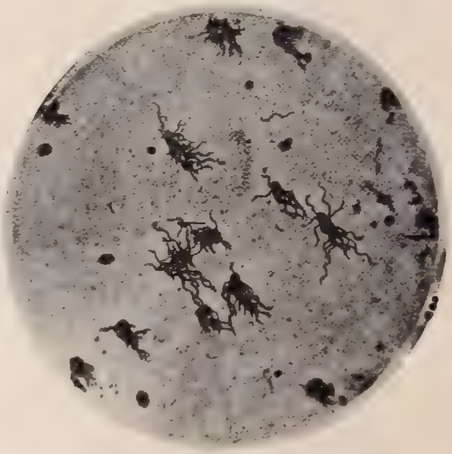
DIRECTIONS TO PATIENTS FOR MOUTH HYGIENE.

By Jules J. Sarrazin, D. D. S., New Orleans, La.

THE dangerous bacteria which cause such disastrous diseases as tuberculosis, typhoid, scarlet fever, diphtheria, influenza, pneumonia, etc., find their most favorable breeding-place in the mouth, lurking in the cavities of dental decay, lodging between uncleanly teeth, flourishing beneath the edges of inflamed gums, permeating hard deposits upon the



Bacillus tuberculosis.
Magnified 1000 diameters.



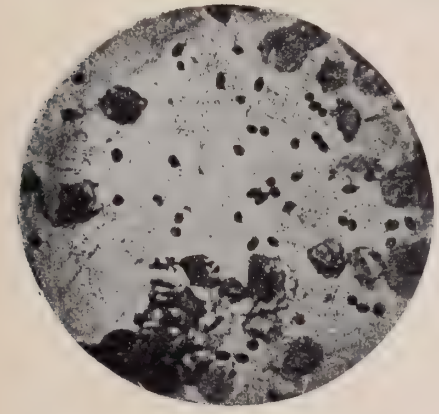
Bacterium typhosus.
Magnified 1000 diameters.

Note—This article is published simultaneously with *The Bur* by special arrangement.—Editor.

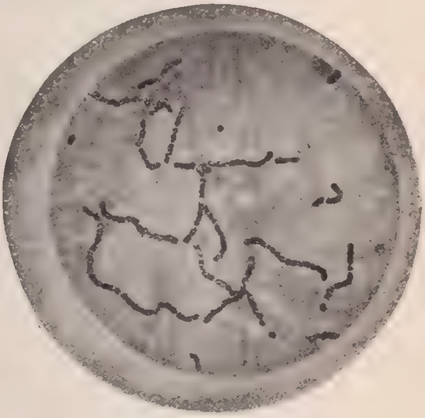
teeth, causing the fermentation of particles of food wherever lodged, rioting in viscid saliva, covering the tongue, and quickly changing the pure flow of saliva into a stream of defilement and infection.

Professor Miller, of the University of Berlin, has shown that nearly all of the disease producing bacteria have been found in the human mouth; thus establishing the fact that this cavity is often the avenue through which infections of a considerable number of serious and sometimes fatal diseases may gain access to the system. He classes diseases caused by bacteria in the mouth under six heads, according to the point of entrance of the infection, substantially as follows:

1. Infections caused by the invasion of bacteria through some abrasion in the gums, palate, tongue, floor of the mouth or throat. These lead either to local or to general disturbances.



Pneumococcus, showing capsule form.
Magnified 1000 diameters.



Streptococcus pyogenes.
Magnified 1000 diameters.

2. Infections caused by the decomposition of dead soft tissue in roots. These usually lead to the formation of abscesses at the point of infection, but also sometimes to secondary septic poisoning with fatal terminations.

3. Disturbances caused by the absorption of poisonous waste products formed by bacteria.

4. Pulmonary diseases caused by the inhalation of minute globules of saliva or small particles of hard deposits from the teeth, containing bacteria.

5. Excessive fermentative processes and other complaints of the digestive tract, caused by continual swallowing of microbes and their poisonous products.

6. Infections of the gum and soft tissue of the mouth and throat, whose power of resistance has been impaired by debilitating influences, becoming incapable of repelling a strong invasion of the microbes of diphtheria, typhus, tuberculosis, scarlet fever, pneumonia, influenza, etc.

Cohn, aided by the microscope, has calculated that bacteria multiply so rapidly that one of them produces 16,000,000 in one day; at the end of two days, 281,000,000,000; while, in three days, the enormous number of 46,000,000,000,000, is reached; having started from a single microbe. They come to our mouths in the air, from the breath of our neighbors, from their cough, from their sneezing, on the particles of dust, on our fingers (and more especially on gloves) and in food and drink. The question is always whether their enemies, which our blood carries, are capable of resisting invasion and destroying them. The mouth is the gateway of life. Keep it pure. The oftener you cleanse it thoroughly, the more you lessen the danger of infection. Some microbes are special residents of the oral cavity, mainly concerned with damaging tooth enamel, preparing conditions favorable to the retention and increase of invaders from the outside. Tooth

Leptothrix gigantea.
Magnified 1000 diameters.

Flagellated spirillæ and vibrio.
Magnified 2000 diameters.

preservation also demands that frequent, thorough and effective sweeping be done, a veritable cataclysm to such minute organisms, while the health of the sockets of tooth roots depends upon the circulation of the blood therein being stimulated by brush bristles rubbing from far on the gums towards the teeth. It is evident from what precedes that gums well filled with good blood can better resist microbic infection besides properly feeding root sockets.

One hardly has the right to expose one's self to increased danger by neglect of mouth cleanliness, but certainly owes it to neighbors and to the community not to disseminate disease-producing bacteria.

Gums should be massaged and teeth cleansed as early as possible after each meal, never missing a thorough mouth toilet at bedtime. Owing to the condition of rest in the mouth during sleep, any residue from food will then ferment more rapidly, increasing dangers both local and systemic.

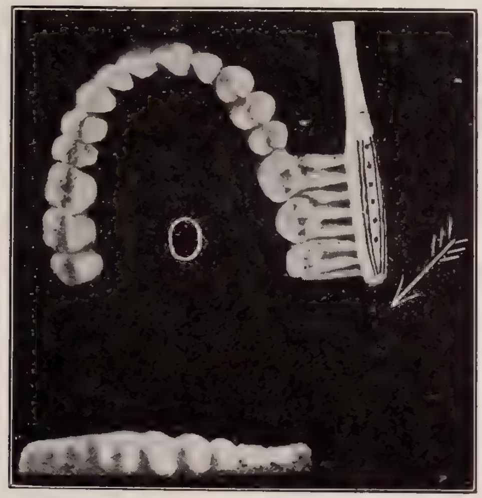


Fig. 0.

A gum massage and tooth brush, to be effective, must be so constructed that it may start its work far on the gums, both inside and outside them, perfectly reach and be adapted to all the teeth of both adults or children, throughout the mouth, enter its bristles in the interspaces between them. sweep back of the most distant grinders. If its construction be proper, it should also be capable of properly cleansing plates, which should be scrubbed with powder, out of the mouth, and remain in an antiseptic solution over night, besides having received attention after meals, like natural teeth.

NEVER BRUSH THE TEETH CROSSWISE

This crowds fermentative material between them instead of removing it, and injures the gums instead of helping them by proper massage. In all localities in the mouth, and particularly at distant grinders, place the brush far on the gums and move its bristles towards the biting surface (Fig. 0) both on the cheek side and on the tongue side of teeth. But the bristles of the most perfectly constructed tooth brush cannot rub between the teeth, either at their points of contact or at their necks. Start by rubbing the necks of teeth at the gums, with a wide, flat, waxed floss silk. (Fig. a, b, c.) At each interspace between all teeth, rub separately on the neck of each tooth. Do this throughout the mouth, above and below. Don't force the silk in violently, but slide it in by the motion shown by the arrows. Teeth next to gaps or last in the arch require even more care than others. Places where silk cuts or catches usually require the dentist's treatment.

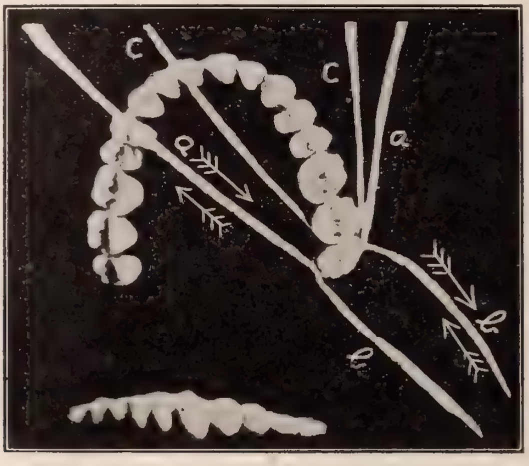


Fig. a, b, c.

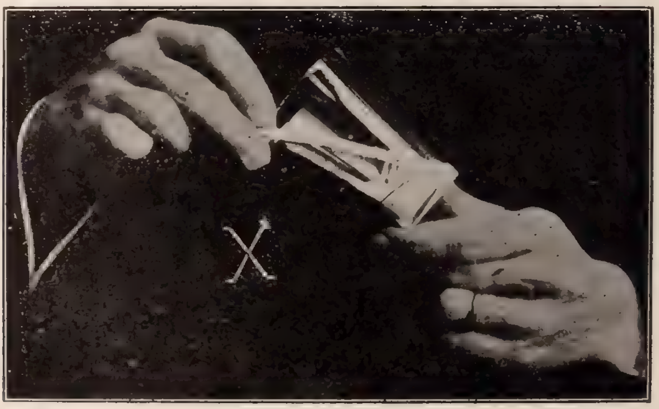


Fig. X.

Next, brush the teeth with both the bristles and the powder as dry as possible. (Fig. x.) As often as saliva wets the brush wipe or shake it dry, and charge it again with plenty of dry powder at the bottom of a small glass.

Hard deposits tend to accumulate on the tongue side of lower front teeth and on the cheek side of upper back ones. They are hot beds of bacteria and directly injure the gums besides. Prevent their recurrence after a dentist has removed them by following these directions faithfully. (Figs. 1,2.) Work the brush in the positions and in the order shown, of course, on both corresponding sides of the mouth above, and move the bristles from the gums towards the teeth. Be especially careful (Fig. 3) to reach far back of the rearmost lower teeth on the inside. Dangerous bacterial films otherwise remain there.

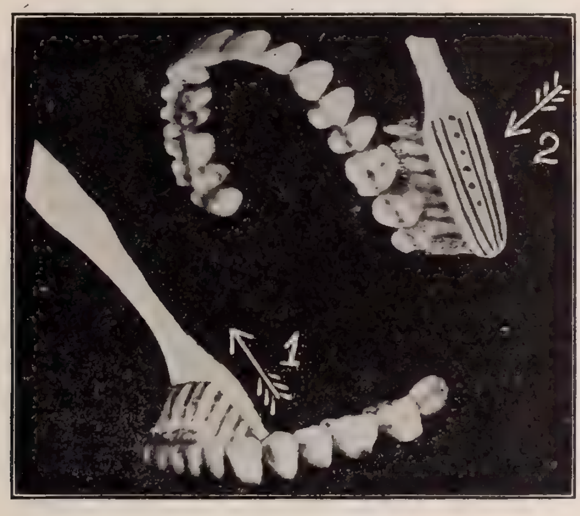


Fig. 1 and 2.

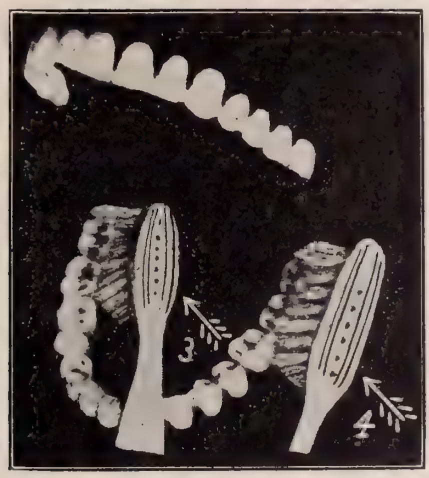


Fig. 3 and 4.

Follow out the order and method illustrated (Figs. 4, 5, 6 ,7, 8) never failing to carry a fresh charge of dry powder to each new locality. Follow the order shown by numbers and the directions of bristles' motion shown by arrows. Keep these illustrations before you as you brush your teeth, until you know them by heart.

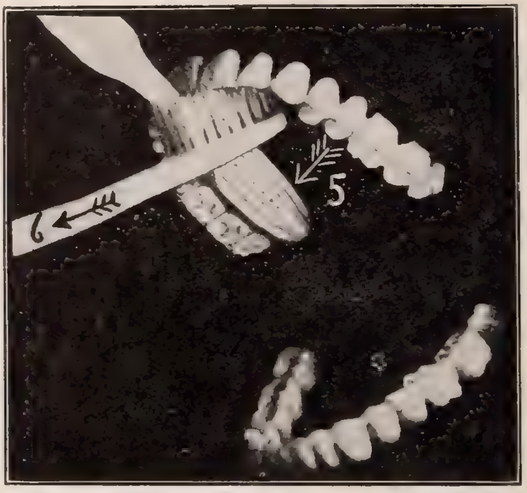


Fig. 5 and 6.

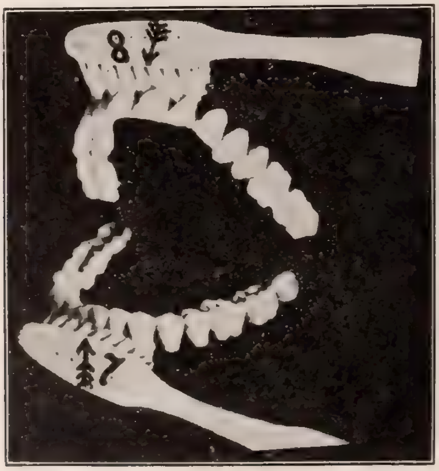


Fig. 7 and 8.

The biting surfaces of rear grinders should receive attention last (Fig. 9). Those farthest back need brushing the most, both above and below. But before a thorough, vigorous rinsing, give special care with dry powder to all teeth which stand next to gaps. The long end tuft of a properly constructed brush will effectively reach behind such teeth (Fig. Δ), but not as well in front of them. Use an ordinary mucilage brush there (Fig. Σ) or any similar one.

Artificial crowns forming the piers of bridges must be kept scrupulously clean to avoid future trouble. Thread silk between a bridge and the gum and rub all along the bridge, underneath it, and on the crowns at each extremity. Brush underneath a bridge as just explained for a gap between teeth. Following these directions *properly* will require five minutes each time. Fifteen to twenty minutes in twenty-four hours cannot be more beneficially employed.

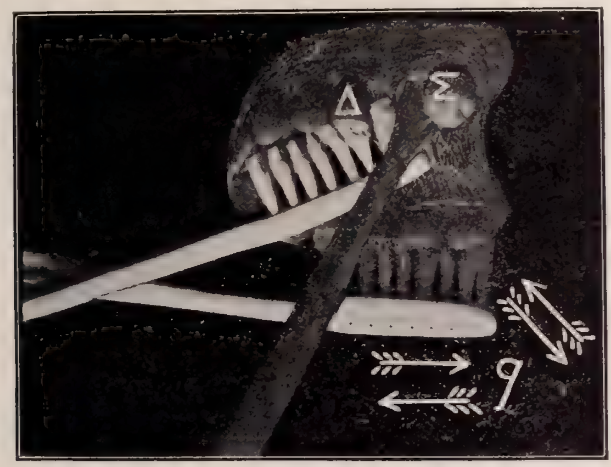


Fig. 9.

Always before putting it away, rinse your brush thoroughly, preventing any particle of food or powder remaining in it after use, and wipe or shake the moisture from it.

TO SUMMARIZE:

Cleanse between the teeth with flat waxed floss silk.

Put dry powder in a small dry glass.

Use the brush dry; charge it with dry powder.

Use plenty of powder and recharge the brush for each new locality.

Brush only *one* surface of *one* row of teeth at a time.

Never brush crosswise, but, instead, let the bristles start on the gums and move toward the biting surfaces of the teeth, both above and below.

Start with the tongue side of the lower front teeth, brushing from the gum upward.

Next, the cheek side of the upper back teeth, being careful to have reached high up and far on the gums and behind the rearmost grinders, brushing downward.

Then, the tongue side of the lower back teeth, reaching behind them and from the gums below them, brushing upward.

Next, the cheek side of the lower back teeth, brushing from the gums upward.

Then the tongue side of the upper back teeth, from the gums downward.

Next, the tongue side of the upper front teeth, from the gums down.

Then the lip side of both the lower and upper front teeth, brushing from the gums towards the biting edges of the teeth.

Next, the biting surfaces of all back teeth, both above and below.

Last, give special attention at gaps where teeth have been lost, whether there be a bridge there or not, as above explained.

If brushing has been extended towards side teeth, from the rear and front positions mentioned, no locality can have escaped proper gum massage and tooth cleansing.

Some mouth wash will usually be advisable at this stage, but a dentist familiar with the conditions of the mouth is alone able to intelligently select it.

Powder is always needed at bedtime, usually after breakfast also, and sometimes oftener, but a dentist's judgment may frequently direct midday mouth cleansings without it.

A hard tooth brush is usually best, but some conditions may indicate a softer one temporarily.

Better brushing can be done by using both hands than with only one. The left hand will advantageously reach the cheek side surface of gums and teeth on the left hand side of the mouth and the tongue surfaces of those on the right side, and vice versa, both above and below. If the right hand only be used, the arm must be well extended, and the wrist curved back to effectually reach the tongue surfaces of right hand side teeth and the cheek surfaces of the left side ones.

Teeth maintained absolutely clean at all times, from childhood to the grave, *except while eating, could not decay,* barring only some less harmful cavities which might develop in enamel grooves which are defective in formation; but *cavities between teeth,* the most damaging kind, *would all be prevented.* The nearer we approach absolute cleanliness, the more we reduce decay.

Unclean teeth charge the food they masticate with toxic matter, endangering health. Trained nurses should maintain scrupulous mouth hygiene in their patients' mouths when they are unable to do it themselves, because mouth fermentative conditions during illness increase dire results, both local and systemic. Dangers increase when one is only ailing, and mouth cleansing should be repeated oftener at such times.

Bleeding or soreness of gums indicates their being diseased, and on the way to still more serious disorder. The dentist's treatment is needed. Afterwards, gradually increase the vigor of brushing and adhere to these directions to maintain a healthy condition. *Disease of root sockets,* leading to looseness and loss of teeth, *could not develop if blood circulation was* *constantly stimulated in the gums from youth to old age.* Massage your gums with the toothbrush as explained. If no deposits have yet formed on roots you can still prevent them.

Being given throughout life a great deal of active open air exercise, early sleep and early rising, vigorous mastication of hard, coarse food, thus producing friction on both teeth and gums; artificial means of mouth hygiene could be neglected with but very little decay and still less socket disease resulting. Civilization, in removing nature's plan, forces us to devise and follow artificial ways of health and teeth preservation, for the two are inseparable.

Upon the preservation of a child's temporary teeth depends the position of the permanent ones, their effectiveness and their appearance. Therefore, between the ages of six and twelve months, three times daily, including bedtime, rub the baby's teeth with cotton wrapped on a small thin stick, charged with a magnesia solution. From one to two years substitute a brush similar to a mucilage one, charged with a magnesia solution, to sweep all the teeth with three times a day and at bed time. When a child is two years old the same directions as those above for adults should be followed and thereafter continued through life.

THE LATEST SWAN SONGS.

By Eugene S. Talbot, Chicago.

EXCUSES made by deans and teachers of commercial dental schools for not raising the standard, or improving the curriculum suggested to me the term "swan songs." These swan songs have been sung for many years. Meet a teacher or dean from any of the commercial dental schools, offer a suggestion for the betterment of their school and graduates and they will commence to sing a song (excuse) familiar even as any one of the popular comic operas. No matter to what part of the country you may go, the familiar swan song greets you when you come in contact with one of these teachers. These teachers will sit up "burning the midnight oil" to study excuses, set them to music and send them over the country. One can hardly travel by rail fast enough to avoid them, so complete has become the organization and manner of transportation.

The time spent in coining excuses if put into research work or used to improve the teaching qualities, would place the dental schools and their graduates on equality with the medical schools and their graduates.

Strange as it may seem, when the discussion of improvement in the teaching of biology, pathology, hygiene or prophylaxis comes up, swan songs are sung instead of discussing improvement in teaching along these lines by adopting and putting into operation these subjects so necessary for the well being of the race.

The latest swan songs for not improving the teaching qualities of our dental schools are, first, the poor boy cannot afford the time and money, and second, that there are not enough dentists in the country to supply the demand. It is said there are 130,000 physicians in the country caring for the sick, while there are only about 30,000 dentists to care for the teeth. It is necessary that no improvement be made in our dental schools until these demands have been supplied. Their idea is to continue these commercial diploma mills, turn out half-baked, half-educated men for the money in it as long as possible.

I had prepared an answer to these swan songs when the following article on "Weak Medical Schools and Nurseries of Medical Genius," from the pen of Mr. Henry S. Pritchett, President of the Carnegie Foundation for the Advancement of Teaching, appeared in the February 25th, 1911, *Journal of the American Medical Association.* This argument being a more forceful reply than anything I could write, I have submitted it for mine. To make it apply to the argument in hand, it is only necessary to substitute the word "dental" for "medical."

WEAK MEDICAL SCHOOLS AS NURSERIES OF MEDICAL GENIUS.

HENRY S. PRITCHETT,

President of the Carnegie Foundation for the Advancement of Teaching.

NEW YORK

"The 'Report on Medical Education in the United States and Canada,' prepared under the direction of the Carnegie Foundation by Mr. Abraham Flexner, was issued in June and has received in one way or another the criticism of nearly all medical journals and medical associations. Those who have represented the Carnegie Foundation in this matter have sought to examine such criticisms and comments in a fair and reasonable spirit. They have felt pleased that the essential facts stated in the report have received no serious contradiction. They have endeavored, on the other hand, to profit in the further study of medical education by the comments made and the criticisms offered.

"It is to be remembered that this report was not a mere criticism of existing conditions. It aimed to point out accurately and frankly the present status of medical education; but it did much more than this. It attempted a thorough-going study of the medical curriculum and it suggested certain broad lines on which the medical curriculum might fairly be expected to develop in the immediate future.

"In seeking to serve both of these ends the report inevitably bore with some sharpness on a large proportion of existing medical schools and particularly on those schools which are commercial in their organization; and by "commercial" it was not meant that those who carry on such schools always derive from them much remuneration in the way of money. A commercial school, in the sense in which the term was used in this report, is a school conducted and managed in the interest of the men who control it; these men expect to receive from it some form of reward, either direct or indirect. The report made clear the fact that all such schools are today offering a form of preparation for medicine which falls far below the grade of efficiency which the people of every state in the Union have a right to demand. It was to be expected that the sharpest replies to the report should come from those institutions whose organization and plan of control run squarely against the principles it advocates. In particular, the commercial medical establishments have in one form or another replied to the facts laid bare in the report, and the deductions made from these facts, with arguments of varying sincerity and relevancy.

"The argument which was most commonly put forth at first was the time-worn plea for the poor boy. The poor school, it was argued, existed for the poor boy. This argument, however, had been so thoroughly anticipated in the report itself and was so clearly not in favor of the poor boy, but in favor of the poor medical school, that it has been practically given up by those who first resorted to its use. In its stead there has been presented in one quarter or another an interesting and singular plea. It is true, say those who put forward this second argument, that a large proportion of the men admitted into the weak medical schools are utterly unprepared; it is true that many of those graduated from such schools ought never to be admitted to practice. Nevertheless, they assert, every now and again in this army of the unfit and the unprepared the school finds some one whom it develops into a great physician or a great investigator—a genius in medical science—and it is worth while, say the advocates of such schools, to keep alive even the weakest medical schools for the sake of the occasional great men whom they may breed.

"The most interesting effort to maintain this position which has come under my eye, and one which has been reprinted in many quarters, appeared in an editorial article in *American Medicine* in October. The attention which has been given to it arises largely out of the fact that the author undertakes to rebuke Mr. Abraham Flexner in his criticism of the University of Louisville Medical School on the ground that his distinguished brother, Dr. Simon Flexner, is a graduate of that institution. The article carries with it something of the force of an *argumentum ad hominem*.

"The tenor of the article may be judged from the following extract:

"What we have stated about Dr. Simon Flexner—facts that no one will gainsay—show conclusively, though perhaps inefficiently, his great usefulness both to his confrères in medicine and to humanity in general. Measured by his scientific stature, his contributions to medicine and his achievements, Dr. Simon Flexner in the light of his brother's dicta concerning medical colleges and their capacities for developing useful physicians, should be a graduate of some one of the large and best-equipped universities. But alas, fate ordained differently, and, according to the last edition of the *American Medical Directory*, Dr. Simon Flexner, the saver of babies' lives, director of one of the world's most famous and most important scientific institutions, a splendid scholar, one of the world's greatest scientists, a man who already has achieved wonders in his chosen field, and one who, if his life is spared, will probably be responsible for the conquest of several of humanity's most fatal maladies, suffered the frightful handicap of equipping himself for his life's work at the University of Louisville Medical Department. . . . .

"We realize that there are other phases of the question and a single case like this offers no real opportunities for comparisons or conclusions. But we still think it carries a valuable lesson and proves our contention that after all the personal equation is the important factor. We need all the Simon Flexners we can get, and a school that can help one such man in each decade to embark on a career so useful to his fellows and all mankind, has justified its existence, Brother Abraham notwithstanding.

"It would be difficult to misrepresent the facts in the case more completely than they have been misrepresented here. The scientific work which Dr. Simon Flexner has done has all been in relation to the subjects of pathology and bacteriology. In the year 1889, when the University of Louisville conferred on him the M. D. degree, the medical school of the University of Louisville had no laboratory for either pathology or bacteriology. Bacteriology was not even taught, and pathology, if taught at all, was taught only in a few lectures given by a practicing physician. The fact is that Dr. Simon Flexner got his real training by ten years of work at the Johns Hopkins University, and these the years which were the most fruitful in its history—the years when Professor Welch, starting with a few chosen pupils, brought up that group of men whose labors have gone so far to revolutionize American medical education in the brief period of two decades. It is difficult to believe that the writer of the paragraphs quoted did not know that Simon Flexner obtained his scientific training, not at the Louisville medical school, but at the Johns Hopkins University.

"While this disposes of the *argumentum ad hominem*, it does not affect the underlying question. The assertion that weak institutions deserve to exist on the ground of the few great men who have come up through them is one constantly made. The argument is, however, fallacious. It is not true that a vast horde of unprepared and ill-trained physicians must be turned out on a helpless public in order to obtain an occasional medical genius. The medical genius, when he comes, will in no way be shut out by the fact that the medical school is on decent standards. On the contrary, the very presence of a group of able, distinguished professors will stimulate such men to emulate their example and to live up to their ideals. It will always happen that a few of the best men will come up from the weaker schools; but the fact that strong men can survive a handicap is a strange reason for maintaining handicaps which injure even the strong man and wreck very many others. The medical genius of thirty years ago had no choice; he had to go to a poor school, for no other kind existed. Today he has a good many alternatives. It is to his interest, genius though he be, that he be compelled to prepare adequately for his medical career and to get a good medical training on this sound basis. Such a policy, of priceless importance to the supposed medical genius, is absolutely indispensable to the man of mediocre ability, and to the public which is at his mercy. The exceptions are apparent rather than real. How much more effective would even the genius have been, if he had not been handicapped by defects of training! Facts showing that a man of high purpose and extraordinary ability may find his way, even under adverse and unfavorable conditions, in no wise furnish an argument, or even an excuse, for making the conditions of education weak and ineffective and for imposing on the public a body of ill-prepared practitioners.

"In all the discussions concerning the poor boy and the medical genius it is well that the public and the medical profession should not be drawn away from the fundamental reasons advanced in this report to show that commercial schools are today hindering, not helping, the cause of medicine. These reasons, briefly re-stated, are the following:

"1. Such schools are essentially proprietary institutions. They are schools managed by physicians who are to profit both directly and indirectly by the enterprise itself. It is true that some of these are nominally branches of universities, but this arrangement is fictitious. This situation has been proved by long experience, to be one under which right educational conditions are impossible. A college or an engineering school run under similar conditions would also become frankly commercial.

"2. Schools so run must depend on fees. This means inevitably the recruiting of a large student body from the unprepared and the unfit. In most schools of this character advertising is freely resorted to. To secure the requisite number of men, standards, both of preliminary education and of technical training, must necessarily be kept so low that the large body can be admitted. This results in putting the instruction itself on a low plane.

"3. Adequate endowment for medical education can never be obtained so long as the exploitation of medical education for commercial purposes is wide-spread. It is a striking fact in educational conditions in America today that medical education has received very meagre support. Particularly is this true when it is remembered that the service which the physician renders to the average man of means is the most direct and personal service which any member of society can offer. No other man has so good an opportunity to present the cause in which he is interested as the family physician. Under such conditions the poverty of endowment of American medical education is a standing reproach to American men of medicine. It is due, as everyone knows, to the fact that the average business man understands that medical education has been hitherto a perquisite of the medical practitioner, and so long as that relation remains no large endowment of medicine can be had. Only when the medical school is managed by a board of men not directly concerned in its profits, whether they be in the form of fees or of increased practice, will it stand in the eyes of givers in the same light as other schools.

"4. Finally, the continuance of such schools under their present conditions is a direct neglect of the rights of the students themselves and of the public, and this for the reason that so long as the conditions which have been described hold, these schools furnish a sort of education far inferior to that which they ought to give and far inferior as well to that which the public has a right to expect of those who are to practice on it. Such schools are practically in the situation which a commercial house would occupy if it sold its patrons old and antiquated machinery, presuming on their ignorance.

"One cannot study even the weakest and most unnecessary of these schools without realizing that not infrequently an admirable quality of devotion is to be found in them. The difficulty is that such devotion is mingled with a very large leaven of commercial interest; and in many cases the devotion is offered in a cause which cannot be approved. The betterment of medical education to a stage commensurate with the present status of medical knowledge is a task which will require the unselfish service, first of all, of the members of the medical profession. It is difficult to see how that service can be rendered until the members of this profession themselves are willing to acknowledge that, whatever may have been true of the past, the time has now come when the commercial medical school should disappear and in its place there should stand a school which, however simple and humble it may be, shall be conducted in accordance with an ideal which divorces the teaching of the doctor or surgeon from the question of securing practice and which unites both science and practice for the benefit of those students who are competent to receive the instruction."

31 North State St.

TEMPORARY DENTURES.

By Dr. C. B. Voigt, Lorain,Ohio.

A distinction is made by many operators between "permanent" and "temporary" dentures. Strictly speaking, any artificial denture might be considered as temporary, and none as permanent. But these terms have been given a special significance regardless of their real meaning. Temporary denture is merely a term applied to a denture inserted immediately upon or soon after the extraction of the natural teeth or before the process of resorption is complete. Practice this and you will have years to look forward without fear.

URIC ACID AS AN ETIOLOGICAL FACTOR IN ALVEOLAR PYORRHEA.*

By Dr. J. C. Walton, Richmond, Va.

SOME time ago I was requested to address the Richmond City Dental Society on the relationship of uric acid to Alveolar Pyorrhea, or Rigg's disease. In that paper I steered clear of all fads and theories, limiting my remarks solely to the clinical manifestations of this disease and recording the results of my experience in the treatment of this most intractable condition.

Permit me to say that I have no pet theory to exploit but desire to present for your consideration the actual conditions as I have observed them.

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*Read before the Virginia State Dental Society, 1910.

Alveolar pyorrhea is doubtless due to many and diverse causes, the uric acid diathesis, infection probably from the yeast fungus, anemia, disorders of metabolism, malassimilation, etc.

The uric acid theory has been worked to death, and, like the liver, is the scapegoat and is often used as a cloak to conceal our laziness—and I might say, our ignorance, also. There can never be any real progress unless we approach these problems with an open and unbiased mind, for, after all, we are co-workers in our earnest efforts to discover the truth, the whole truth and nothing but the truth.

It is, therefore, a matter of deep regret that so many self-constituted authorities attempt the solutions of these problems without the honest and painstaking investigations that should entitle them to be heard. Send a specimen of urine to any clinical laboratory for a complete examination and never a word in the report in regard to the uric acid findings, and should you have the temerity to ask for them the gratuitous information will be forthcoming that this is entirely unnecessary as uric acid has no clinical significance whatever.

Dr. Haig was one of the few investigators who took the time and labor to verify by laboratory work his clinical conclusions regarding the significance of the uric acid findings. Yet most of our authorities dismiss the subject with a shrug of the shoulders and the remark that Haig was a uric acid crank, and while I do not pose as a Haig champion, as all pioneers are more or less extremists and some of their conclusions must be taken "Cum grano salis," simple justice forces the admission from his bitterest detractors that Haig's researches on the relationship of diet and its influence on uric acid excretion has started us thinking along right lines.

I esteem it a privilege, as well as an honor, to respond to your kind invitation to address this distinguished association of representative men on one of the many clinical manifestations of that "Hydra-headed monster," *Uric acid*; and especially as to uric acid being a contributing etiological factor in alveolar pyorrhea, which I am informed is the "Bete Noir" of the dental profession. I shall confine my remarks mainly to the clinical aspects of the subject, as time will allow only a very brief allusion to the innumerable and diverse theories regarding the genesis of uric acid and its effects on metabolism; and, vice versa, the effect of metabolism on uric acid, according to the pet theory of each individual writer. And furthermore assume that one well established clinical fact is worth a thousand theories, and that results, not theories, is our goal and the relief and cure of our patients is the paramount end that transcends in importance all other fads and fancies.

Uric acid was discovered in 1776 by Karl Schreele, and in the same year T. Bergnman found it in a stone in the bladder. Barker's little book, "The Truth and Poetry Concerning Uric Acid," gives a most interesting review of the history of the subject and we take the liberty of freely quoting therefrom. "The relationship of uric acid to urea naturally suggested similar origin for these two substances, and the earliest theories took it for granted that uric acid, like urea, is a product of proteid metabolism, and since uric acid yields urea as one of its oxidation products, two hypotheses seemed possible—either all proteid or oxidation to urea passes at some time or other through a uric acid stage, or proteid is normally oxidized directly to urea, but under certain pathological conditions, to uric acid instead. In case either hypothesis were true, a fault of oxidation would account for the increased amount of uric acid. This view is not now generally accepted and the latest theory is that uric acid is derived from nuclein and that the xanthin bases related to uric acid, i. e., xanthin, adenin and quanin, which can be obtained from nuclein."

Spitzer, in 1903, after feeding nuclein to rabbits and man, found an increase of uric acid from nuclein, which demonstrates that foods rich in nuclein or in xanthin bases, exercise a powerful effect on the excretion of uric acid. It was now clear that uric acid excretion could be derived from at least two sources—first, from the nucleins of the cells of the body itself, and second, from the nuclein and xanthin bases of the ingested foods. From this time on it became customary to speak of the purin bodies (xanthin bases plus uric acid) in the urine rather than simply the excretion of uric acid.

Certain animals, birds and reptiles excrete most of their nitrogen, not as urea, as in mammals, but as uric acid. In these animals the amount of uric acid excreted varies with the amount of food ingested. It sinks in inanition, it is increased in all conditions which augment proteid metabolism, and substances which are fed to mammals and oxidized to urea, are excreted in birds as uric acid. All these facts show that in birds and reptiles synthesis plays an important part in uric acid formation.

Croftan, in 1905, found that the various organs destroy uric acid and, indeed, that some of the organs that build it also decompose it.

In carnivorous and omnivorous animals it would appear as though the liver is actively destructive of uric acid, while in herbivorous animals the synthetic production of uric acid would seem to predominate over the destroying power of the organ.

Croftan's studies of Human Tissues indicate that bulk for bulk the human kidneys destroy more uric acid than the liver, the liver more than the muscles, the muscles more than the spleen and the blood. Comparing the relative bulk of these organs as compared with the bulk of the whole body, he finds that the muscles destroy most uric acid, next the kidneys. then the liver, the spleen and the blood.

Pure uric acid is a light white powder and consists microscopically of rhombic tablets; it dissolves sparingly in water and is insoluble in alcohol and in ether. Solubility in water is 1 in 39,480 at 18 degrees C. It is to be regretted that our knowledge of the pathological significance of uric acid is not more definite and that in the uric acid diathesis we are unable to decide whether the condition is one of the solubility of uric acid and the urates, or one with real disturbances in uric acid formation and destruction.

Our distinguished townsman, Dr. Moses Hoge, in his "Diagnostic Urinalysis," the best manual on this subject extant, says of uric acid and of its clinical significance: "Uric acid is a constant constituent of the urine of carnivora. It is sparingly soluble in water, but is insoluble in alcohol and ether. Uric acid is dibasic; hence it may combine with sodium, calcium and ammonium, to form the acid urates; or it may combine with potassium, calcium and lithium to form the neutral salts. Uric acid is formed chiefly in the liver. The average quantity excreted in 24 hours is about 7 to 10 grains. The proportion of urea to uric acid is about 45 to 1. Uric acid is only deposited in acid urine.

A deposit of uric acid occurring after 12 hours has no pathological significance. If it deposits immediately, or as soon as the urine cools, it shows that the same thing may occur in the renal tract, and give rise to gravel or stone.

In fact, any deposit, except mucus, taking place within 12 hours shows that something is wrong.

As a sediment, uric acid is almost always of a yellowish or brownish color. This is important, as all other sediments are colorless; hence cannot be uric acid or urates. A rough estimate of uric acid may be made by multiplying the last two figures of the specific gravity by two. This gives the quantity in centigrams per litre.

A very reliable and simple test for the estimation of uric acid excess in the urine was taught me while a student in the N. Y. Post Graduate Medical School and Hospital. Take 10 CC of urine and add 10 to 15 drops of a 4% solution of acetic acid and boil. After standing for 24 hours the uric acid excess will be thrown down as a reddish brown precipitate. This precipitate represents accurately the amount of uric acid excess contained in the urine. Garrod's test for uric acid in the blood: to a little blood collected in a watch glass is added some dilute acetic acid; a linen thread is immersed in the mixture and the whole allowed to stand for 24 hours, evaporation being prevented. If the uric acid in the blood is increased, crystals of uric acid separate out, adhere to the thread and can be recognized under the microscope.

In a very interesting and able article on "Alveolar Pyorrhea" in *The British Medical Journal* by your distinguished fellow, Dr. Edward Eggleston, "who is well qualified from his large experience to speak authoritatively on this subject," the doctor regards alveolar pyorrhea as being always due to constitutional causes such as disorders of metabolism and functional disturbances of the liver, kidneys, heart or lungs, with about one-tenth of the cases due to uric acid excess.

Dr. Eggleston well says that the best results are to be had by a thorough co-operation of the general practitioner with the dental specialist.

In this connection it is greatly to be desired that dentistry be elevated, so as to place the operator on a plane of perfect equality with the general practitioner of medicine and surgery. I heartily endorse the above. The writer has long regarded dentistry as one of the most important of the branches of medicine and surgery and on an equal plane with the other local specialties, viz., the eye, throat, stomach, rectum, genito urinary diseases and orthopedic surgery.

A trite old adage says, "No foot, no horse." Of the individual it may as truthfully be said, "No teeth, no digestion," for mastication is the first and the most important of all the digestive functions, for poor mastication means poor digestion and all its attendant ills such as malassimilation, malnutrition and thus renders the organism susceptible to almost every ill that flesh is heir to.

For more than a decade I have had unusual opportunities for studying lithemic conditions, or the uric acid diathesis, wherein the blood contains an excess of uric acid and its salts, and the urine is loaded with nitrogenous waste. In most of these cases a careful clinical and laboratory study of each individual was made and a uric acid excess was found. Under the influence of eliminants this uric acid excess would be temporarily increased as shown by daily analysis for the first week or so and not infrequently all the symptoms would become aggravated so much so that it would frequently be difficult to get the patient to persist with the treatment; however, at the expiration of this period the output of uric acid would decrease and the various symptoms begin to clear up and the patient be gradually restored to health.

So uniformly has this been my experience and the relationship between cause and effect so apparent, that I am strongly inclined to accept the uric acid hypothesis, especially so since the treatment for lithemia overcomes the pathological conditions and gives relief after the failure of the usual orthodox remedies. Therefore, it is immaterial from the therapeutic view-point whether the uric acid is a cause or effect, or is merely a coincidence, the cold facts in hundreds of instances having shown that a judicious combination of eliminant and dietetic measures is the only procedure so far known that offers hope and relief to this large class of invalids.

Since engaging in special work, I have been surprised to find such a large proportion of invalids suffering from lithemic conditions, viz., rheumatism, neuritis and kidney diseases.

Most of the cases of alveolar pyorrhea referred to me for treatment were lithemic and under general eliminant and dietetic measures with the applications of the high frequency currents and the co-operation of the dental surgeon responded promptly with the most gratifying results. Dietetic treatment is very important and too much stress cannot be laid on the avoidance of uric acid-producing foods, especially the nucleoproteids, and the xanthin bases. Avoid teas, coffees, chocolates, cocoas, beef, pork, veal and lamb chops, sweetbreads, liver and kidneys, tomatoes, rhubarb, grape fruit, with peas and beans only in small quantities. Don't forget that the flesh of young animals is richer in nuclein than the flesh of older animals and should therefore be avoided. The patient may take poultry, fish, oysters, milk, butter, mutton chops, fruits and vegetables.

The free use of water internally in indicated as a resolvent, for flushing out the different emunctories and for its depurative effects on the tissues. I usually advise about 16 glasses a day of some good soft water, preferably a water containing a considerable amount of carbonic acid with a small amount of sodium and potassium. I place very little reliance on lithia as a uric acid solvent, as it is well known that there is only an infinitesimal amount of lithia in any mineral water and that their virtues are probably due to "radio-active properties."

Baths, or the external application of water to the surface of the body, are by far the quickest, safest, sanest, as well as the most pleasing and satisfactory method of eliminating uric acid and all other effete material from the organism.

To obtain the best results it is necessary to produce free perspiration or sweating, and one of the best indices to improvement is the quickened response of the sweat glands to the hot air cabinets.

The skin being a vicarious organ to the kidneys, it can be made to do part of the work of the kidneys and thus save these overworked organs from the irritating effects of uric acid and other poisons.

The cabinet, or baruch system of baths, is an ideal method of inducing elimination, and it is probably the only system that combines both tonic and eliminating effects without depressing or weakening the patient.

Dumesnil, in a recent publication, has reported a large number of cases of alveolar pyorrhea of specific origin, not that this is causative except in lowering vitality and lessening elimination; and hydrotherapy is especially indicated in those conditions where iodides and mercury have to be given continually and for long periods of time.

These *remarkable high frequency currents,* which are of quite *recent development* have created as great a sensation in the medical world as they have commercially in the application of wireless telegraphy and the telephone. These currents profoundly affecting as they do the chemical processes of the body, increasing tissue combustion and oxidation and facilitating the elimination of waste products. Nitrogenous debris, which would otherwise form uric acid, is converted into urea and the peripheral circulation is increased through vaso-motor stimulation and regulation. Its antiseptic and vitalizing influence on the tissues makes it especially valuable in the treatment of alveolar pyorrhea, as it meets the indications, after the dental surgeon has removed all foreign deposits and put the teeth and gums in a good surgical condition.

SUMMARY

No physical examination can be complete without an examination of the teeth and gums and if they are in poor condition the patient should be peremptorily referred to a good dentist, not to the advertising dentist who will without compunction spoil several sound teeth to place a costly bridge with the sacrifice in the mechanical power of the jaw of over sixty per cent. Beginning the treatment, therefore, with the aid and the co-operation of a good dentist, it is started by applying the X-Ray for about two minutes, the lips being left open and the teeth and gums exposed to the X-Ray. This is followed by the high frequency current applied with the vacuum electrodes placed in direct contact with the gums, using an insulated handle so that the lips receive none of the current. The electrodes are in different shapes for application to the lingual or buccal surface of the gums and the current is applied for thirty seconds and then changed to some other part. This combined treatment is used three times a week and petrogen iodine, 10 p. c., is frequently applied on the electrodes (cataphoresis). The applications are painless and there is decided improvement and relief, and in three or four weeks the discharge has diminished, the tenderness disappears, the teeth tighten and there is a marked improvement in the general health.

''Tousey Medical Electricity'' says that the cases with the most brilliant results are those with ragged looking ulceration of the gums. Those which appear to be susceptible of only a moderate amount of benefit are those with a clean gingival border, but with a pale cartilaginous appearance, looking as if the gums would not bleed if cut with the knife. These cases are often dependent on anemia and the indication is for fresh air, tonics and exercise rather than for local applications. It appears probable that many of these cases can be permanently cured and the teeth saved with this treatment combined with proper care by the dentist.

References:

Barker, ''The Truth and Poetry Concerning Uric Acid.''
Hoge, ''Diagnostic Urinalysis.''
Tousey, ''Medical Electricity.''
New York Medical Journal.

The chance for which you have waited long
May come before you lie down tonight—
Are you ready?
Have you learned your part, is your courage strong,
Are your muscles strong, is your armor bright,
And your purpose steady?
—S. E. Kiser

OSTEOMYELITIS OF THE LOWER JAW*

By H. H. Germain, M. D., Boston

THAT true osteomyelitis of the mandible is an infrequent condition is generally conceded. Considering the opportunities offered for infection in this bone, it seems strange that the disease is not more commonly observed.

Many authors have remarked that the lower jaw is closely allied in structure to the long bones. This is partly true for the body, but not at all for the rami. The body differs from the long tubular bones in that teeth germs are present in childhood, while in the adult alveoli exist for the teeth. The rami resemble the flat bones, since their structure is denser and the marrow is of the spongy or diploetic variety. After the teeth have been lost and the alveolar process absorbed the body also assumes the character of the flat bone. In the jaw of the adult containing teeth the presence of large open marrow spaces together with the inferior dental canal favors the spreading of infection in the body of the bone. It appears, in fact, as has been emphasized by Dependorf,[1] that the canalis mandibularis possesses the same characteristics pathologically as the medullary cavity of the long bones. Infection travels along this canal with the greatest ease, while the surrounding medullary spaces act as reservoirs for pus. Hence in the body of the jaw the process is often a diffuse rapidly spreading disease. The above conditions do not obtain for the rami, and here we should expect the disease to be more localized. Kaleibe[2] and Dependorf,[1] who have investigated this condition, state that this is true and that small foci of suppuration are most often found in this portion of the bone in hematogenous infection.

ETIOLOGY

Having the above anatomic conditions in mind, our next task is to review the etiology of the disease. That the infectious agent finds entrance into the bony substance by way of the teeth goes without saying. Probably eight-tenths of all cases arise in this way. Infections from gangrenous pulps or from abscessed teeth are the most common (see Cases 1, 2 and 3). Impacted third molars also furnish a fair number of cases if one can judge from the number reported. Perthes[3] lays great stress on this latter cause. Pyorrhea alveolaris, noma and gangrenous stomatitis furnish occasional cases (Case 4).

Traumata without fracture may act as predisposing factors, as they produce extravasations and disturbances of circulation which furnish an opportunity for the carriers of infection to settle at the point of injury.

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*Read in the Section of Stomatology (A. M. A.), of which THE SUMMARY is the representative organ for the dental profession by special arrangement with the Jour. Amer. Med. Asso.

1. Dependorf: Volkmann's Sammlung klinischer Vorträge, 1906, No. 440.
2. Kaleibe. Inaug Diss., Halle, 1881.
3. Perthes: Verletzungen und Krankheiten der Kiefer, 1907.

Trauma resulting in fracture frequently furnishes a direct path for infection from the oral cavity or outer skin, since the majority of these fractures are compounds. Cases 5 and 6 are examples of fractures compound into the mouth, while Case 9 opened into the external auditory canal.

Excluding infection from the mouth or outer skin, the remaining cases are the result of hematogenous infection. These may follow acute infectious diseases, as scarlet fever and typhoid, or may accompany a septicemia from any cause. Hematogenous osteomyelitis is the only example of pure infection, usually of *Staphylococcus aureus* or streptococcus, which we have in the mandible. This refers, of course, to the condition before communication with the mouth is established. All others are necessarily mixed infection from contamination with mouth bacteria. It is probable that long exposure to cold and dampness is a predisposing factor to this disease; the same may be said of metallic poisons.

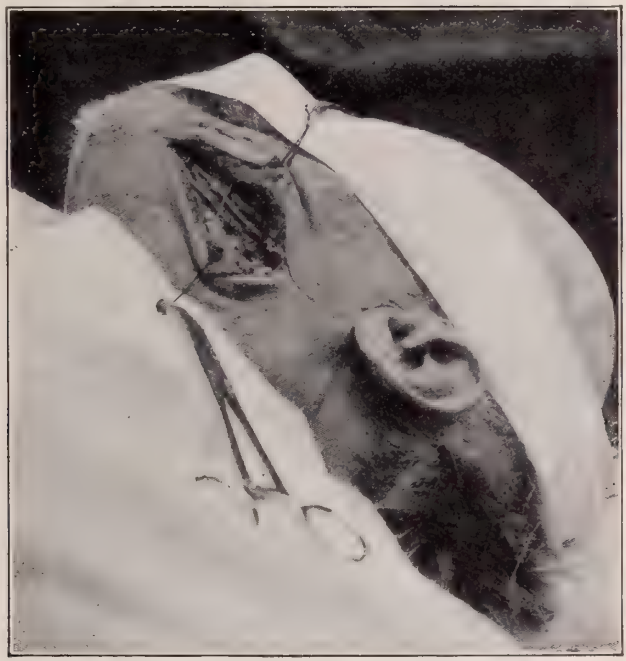

Fig. 1.—Completed operation, showing facial wall of lower jaw removed.

Previous to 1881 so-called idiopathic osteomyelitis was mentioned by Rosenbach[4] and Lannelongue,[5] but in that year Kaleibe pointed out and discussed in detail acute infectious osteomyelitis, recognizing the true nature of the disease.

SYMPTOMS AND COURSE

The sudden spontaneous appearance of gnawing pain is a phenomenon which is well known in all cases of osteomyelitis, regardless of situation.

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[4] Rosenbach: Deutsch. Ztshr. f. Chir., x, 492.

[5] Lannelongue: Bull. et mém. Soc. de chir. de Paris, viii, 263.

This is usually followed by more or less swelling of soft parts accompanied by fever, and after a time abscesses form and point into the mouth or externally through the cheek or outer skin. With the evacuation of pus temporary relief from pain is observed, but with the progress of the disease more abscesses form with recurrence of symptoms. If the process is diffuse the periosteum is stripped from the bone and the teeth loosen or are extracted to promote drainage of pus. Sooner or later part of the bone dies, and with the casting off of the sequestrum the process usually stops. Not infrequently a different course is seen; the suppuration and swelling are reduced and the disease becomes localized; the jaw thickens and the soft parts become dense and indurated. This localized form occurs most frequently in the ramus of the jaw in hematogenous cases, but it may occur in the body, provided good drainage is established.

The diffuse form is, as a rule, very acute, impairing the general health rapidly by septic absorption and also by the fact that the trismus which is present makes it impossible to masticate and swallow food. These patients can open the mouth a quarter of an inch or less, a condition which makes speech, deglutition and mastication difficult or impossible. It often happens that a large amount of pus is swallowed from discharging sinuses in the mouth. How much effect this has on the general condition is hard to estimate, but no one will deny that the circumstance is unfavorable to good digestion.

Exactly what controls the size of the sequestrum in an untreated patient is impossible to say accurately. That a total necrosis does not frequently occur seems to be due to an inherent tendency which the marrow possesses to wall off the disease by the formation of dense bone from the endosteum. We have seen that anatomically and pathologically the long bones and the lower jaw are very similar, and it is to be noted that there is a third analogy, i. e., the uniformity in the conduct of the periosteum after loss of parts of the cortical bone. If diffuse necrosis occurs before complete development the longitudinal growth is, of course, much disturbed, but it is the rule that the diametrical growth will go on and new bone be formed provided the periosteum remains intact. The time required for the formation of a loose sequestrum varies in individual cases from twelve to twenty weeks, at the end of which time a fairly firm involucrum, or shell of periosteal bone, is formed. For some time the involucrum is soft and the muscles of the face and jaw produce a certain amount of deformity by shortening the newly formed mandible if the sequestrum includes the entire diameter of the jaw. As a result of this shortening there is malocclusion of greater or less degree as is seen in Case 3. As a rule it may be stated that the body and ramus will be reproduced, but the alveolar process will not be restored after destruction.

It has been noted that in practically all cases pus finds an outlet on the facial side of the mandible either in the mouth or externally. It is also true that part of the facial wall often becomes necrotic and is cast off as a sequestrum, while the labial side is rarely affected in cases of partial necrosis. The exact reason why the disease selects preferentially the facial side is not perfectly clear, but the large size of the marrow spaces below and to the outer side of the inferior dental canal offers the most likely explanation, since the line of least resistance is in this direction, i. e., toward the facial wall.

As has been observed, the symptoms in an acute case may subside, sinuses form and the disease take a sub-acute or chronic course. In this event it is usually found that there is a sequestrum present which must be removed. In the jaw there is also a possibility that there may be a dead tooth which can give the case the appearance of a chronic osteomyelitis. Cases of this kind are frequently seen and a number have been reported in which the external opening of the sinus was at a distance from the original cause in the jaw. The following is an example of one of these cases: Male, age 20, developed spontaneously a small abscess about the center of the anterior border of the right sterno-mastoid muscle. Abscess was drained, but a sinus persisted which resisted all treatment. Finally a dead second molar was extracted. Immediately blood appeared from the sinus and methyl blue dropped into the cavity left after extraction made its appearance at the external opening. Similar instances are reported by Perthes. In Case 9 of this series there was a sinus in the external auditory canal which on superficial examination resembled otitis media.

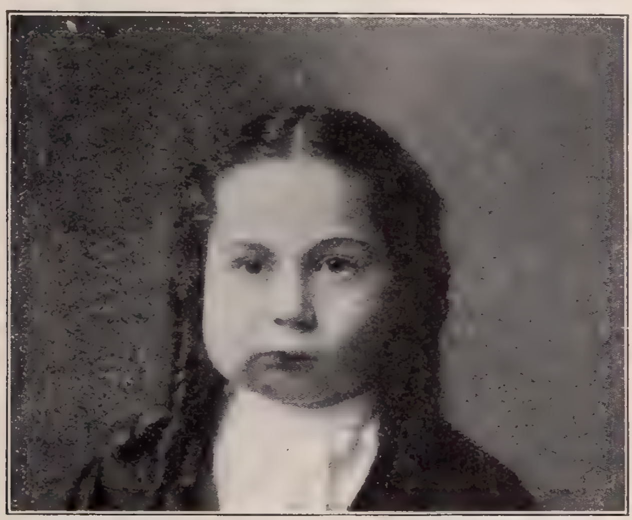

Fig. 2.—From photograph of Patient 3; note shortening of lower jaw.

These teeth sinuses are particularly frequent in the region of the chin, where a dead incisor or cuspid may be the offending agent. Extraction of these dead teeth may be insufficient for cure, since a pocket of pus and granulations may be present at the apex of the root. Case 10 in the following series is an example.

DIAGNOSIS

Occasional difficulties in diagnosis will be experienced, but they are fortunately rare. Cases of malignant disease with secondary infection are stumbling blocks which occur now and then. Syphilis and actinomycosis may, of course, confuse. Suppurating dentigerous cysts have been seen often enough to make one consider the possibility. Phosphorus necrosis is extremely rare at the present time. In all of the above conditions, except syphilis, the treatment is surgical and at operation there is rarely any difficulty as to the best course to pursue.

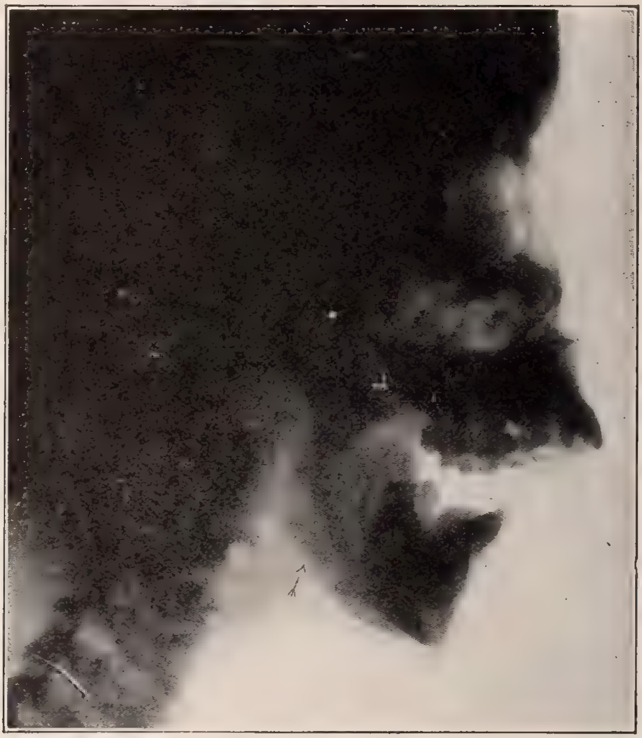

Fig. 3.—From X-Ray of Patient 3; shortening of lower jaw apparent here also.

The most valuable information may be obtained by the X-Ray in cases in which the disease is localized, in which there is a definite sequestrum or in which fracture is a starting-point of the disease. In Cases 10 and 11 foci of suppuration were located with accuracy. In Case 6 the X-Ray showed a fracture which was the starting point of the infection. In Case 3 a definite sequestrum was found to be present. Good X-Rays are difficult to obtain of the condyle and upper part of the ramus, but when obtained may be of the greatest aid.

A careful study of the plates may rule out sarcoma and syphilis in certain doubtful cases, but at times both cancer or sarcoma accompanied by bone destruction are difficult to differentiate from osteomyelitis by any known means except the microscope.

TREATMENT

In acute cases affecting the body of the mandible the general rule for treatment should be to remove the facial wall of the lower jaw through an external incision, exposing the inferior dental canal (Fig. 1). In this way all large marrow spaces are opened, the best possible drainage obtained, the firm inner wall is left which keeps the jaw in shape and an opportunity is given to retain the teeth. A good example of the result of this procedure is seen in Case 6, in which the disease was checked and all of the teeth retained. That this method is far superior to incisions in the mouth is obvious and needs no discussion. The gravity of the disease demands radical treatment and leaves us little choice as to whether scars should be left or not.

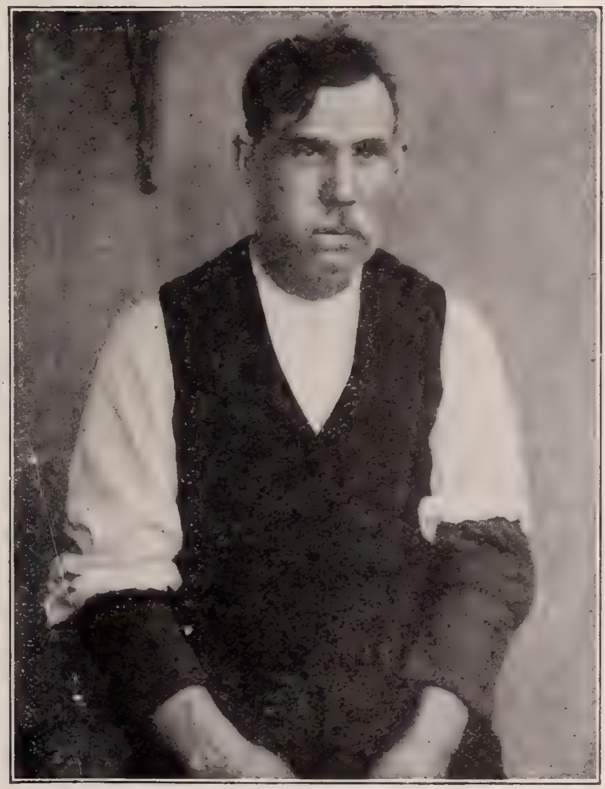

Fig. 4.—From photograph of Patient 6, front view.

Subacute and chronic cases are a law unto themselves and no definite method of treatment can be laid down for their relief. In general we may say that the treatment of each case is a hunt for diseased teeth, pockets of pus and sequestra. Sequestra representing the entire thickness of the jaw should be left until a firm involucrum is formed in order to minimize deformity. These cases need careful watching, as acute exacerbations occur frequently and are troublesome and dangerous.

Trismus is frequently an annoying feature and rectal or nasal feeding may be necessary. Hot applications externally may give some relief from this condition, which is usually a combination of muscular spasm and inflammatory edema.

Lymphadenitis and angina Ludovici may occur at any time. The latter demands immediate surgical intervention.

DEFORMITY

After loss of large portions of the jaw, as in Case 3, a certain amount of deformity results with shortening of the body on the affected side. Certain plastic operations have been devised to relieve this condition and it seems probable that bone might be implanted successfully in order to overcome the difficulty. Up to date I have been unable to find a patient who was willing to undergo the ordeal after recovering from an acute process in the jaw.

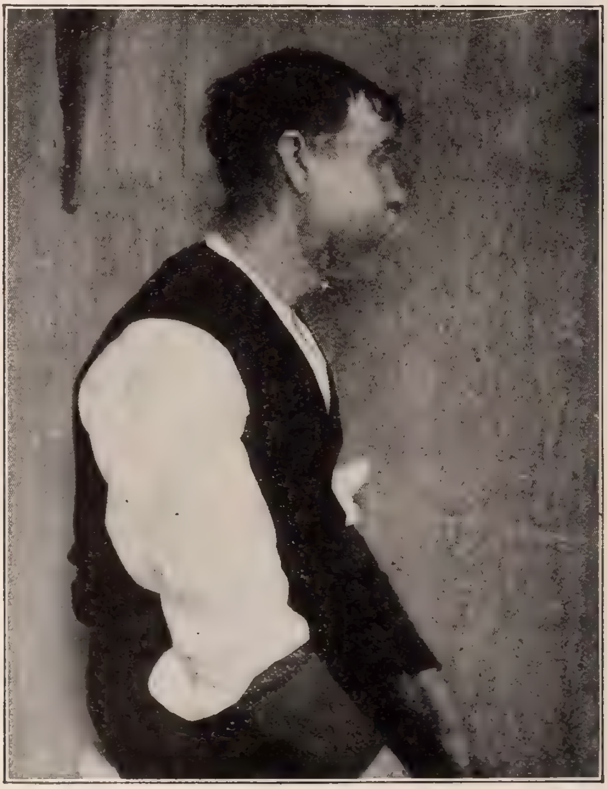

Fig. 5.—From photograph of Patient 6, side view.

SUMMARY OF CASES

Case 1.—A man, aged 41, entered hospital May 5, 1905; no history of injury. Illness had begun two weeks previously with pain and swelling in cheek; now showed indurated swelling of lower jaw to the left of the median line the size of half an orange. Operation was performed; chin incised and bone curetted. Patient returned to hospital Oct. 3, 1905; had several sinuses which had never healed. Examination showed two sinuses leading to bone near median line. Incision from one angle of the jaw to the other showed the whole jaw to be necrotic and large amount of bone was removed. Patient returned to hospital again a year later when more dead bone was removed from the left side of the jaw. Since then he has been well.

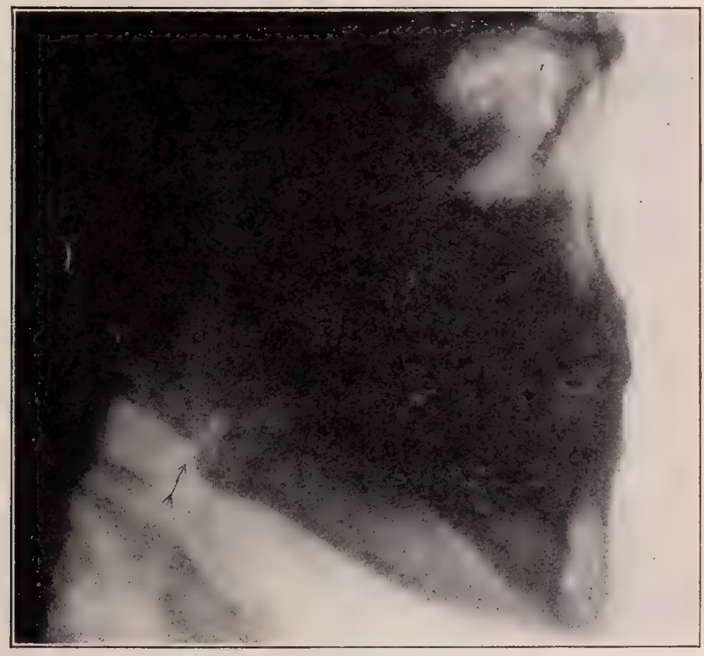

Fig. 6.—From X-Ray of Patient 6; note fracture.

Case 2.—A man, aged 56, for ten weeks had pain in lower jaw following extraction of a molar tooth, with trismus, painful deglutition and constant pain which was worse at night; he had lost thirty pounds in ten weeks. At operation the sequestrum was removed from left side of jaw which consisted of alveolar process and part of body. Uneventful recovery.

Case 3.—A girl, aged 9, five months previous to examination had had abscessed molar removed without relief from pain; later had all of teeth removed on same side without relief. The jaw became swollen and tender and was lanced several times. Examinations showed whole face of affected side much swollen with external sinus at angle of the jaw (Fig. 2). X-Ray showed large sequestrum (Fig. 3). Operation was performed and sequestrum consisting of large part of the body and all the ramus on right side removed; fairly firm involucrum present.

Case 4.—A girl, aged 3, had lost all teeth of lower jaw with alveolar process during an attack of noma. Lower lip was adherent to jaw with mouth about three-quarters of an inch in diameter.

Case 5.—A boy, aged 7, whose lower jaw had been fractured during extraction of a tooth fourteen months previous to the time he came under observation, after this had an abscess under the jaw which was opened several times. At operation sequestrum was removed from left half of body of lower jaw. Recovery was uneventful.

Case 6.—A man, aged 50, received blow on chin, Feb. 24, 1909; twenty-four hours later he had acute pain with trismus, difficulty in swallowing and in speech. Examination showed diffuse swelling (Figs. 4 and 5); abscess was opened three days afterward. X-Ray showed a fracture of the lower jaw through the last molar (Fig. 6). Six weeks later, owing to persistent pain and swelling, the facial wall of lower jaw was removed with good recovery.

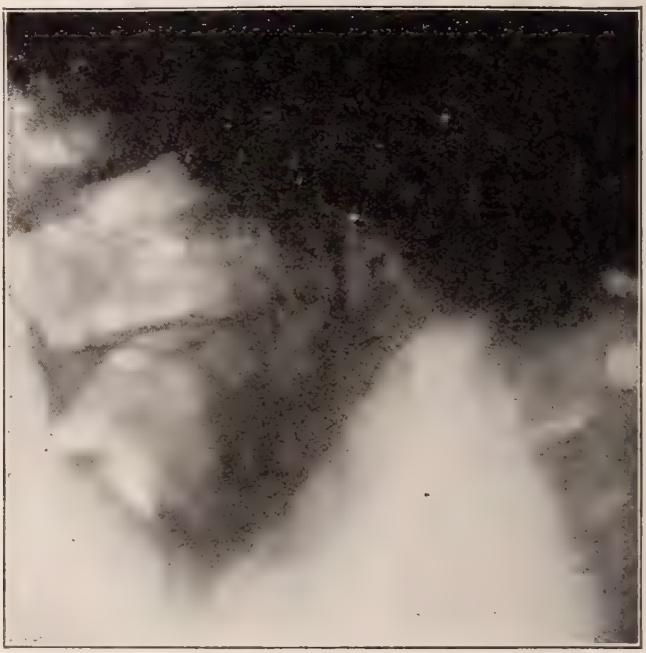

Fig. 7.—From X-Ray of Patient 9; note absence of condyle and upper part of ramus.

Case 7.—A boy, aged 19, six years before operation was kicked in the chin, following which an abscess developed and was opened; sinus was persistent. At operation sequestrum was removed from under incisor teeth; recovery was uneventful.

Case 8.—A girl, aged 11, two and a half years before operation was struck in the chin by a blow of the fist. Following this an abscess developed, which was opened, leaving a persistent sinus. At operation the sinus

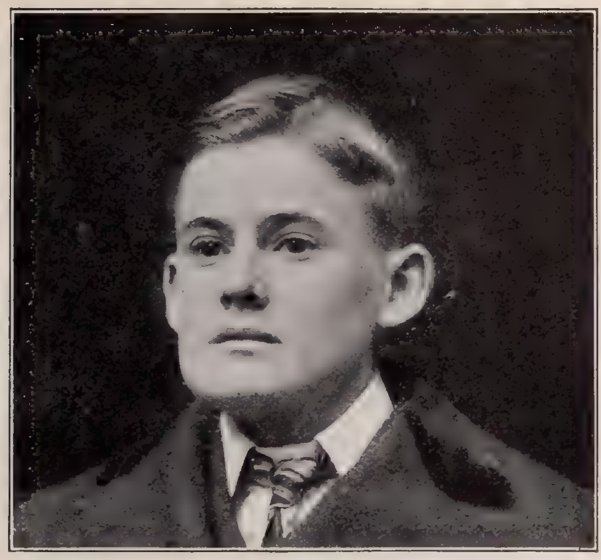

Fig. 8.—From photograph of Patient 10; note swelling on right of lower jaw.

led into a cavity under the first molar, into which the root projected. Tooth was extracted and cavity curetted; recovery was uneventful.

Case 9.—A man, aged 42, was struck in the chin by a limb of a tree three months before examination; he was rendered unconscious and awoke in hospital. At that time diffuse swelling of left side of face with facial paralysis and bleeding from the left ear were present; the patient was in

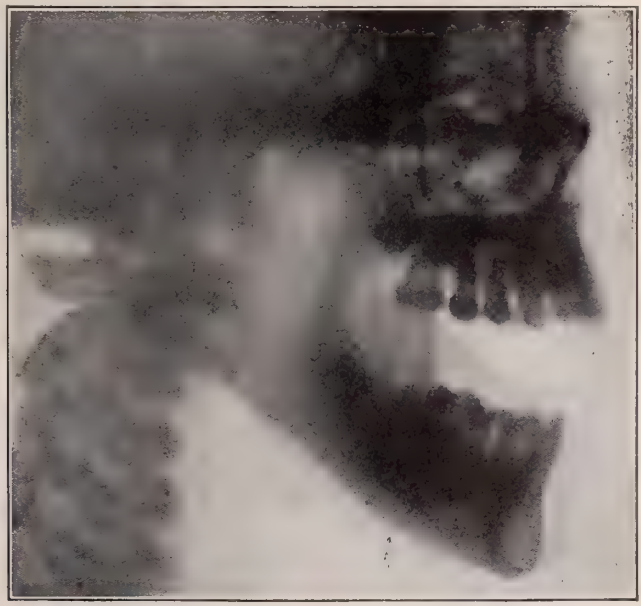

Fig. 9.—From X-Ray of Patient 10; note thickening of periosteum.

hospital six weeks. He now sought aid on account of discharging ear with pain in region of ramus of jaw on the same side. Examination showed sinus leading forward from cartilaginous canal to region of glenoid fossa. At operation necrotic condyle was found broken off and lying in zygomatic fossa (Fig. 7). Recovery uneventful.

Case 10.—A boy, aged 13, had had abscessed bicuspid removed six weeks previously. The mucous membrane healed, but persistent swelling of the whole lower jaw and cheek remained (Fig. 8). This swelling varied and at times partly closed the right eye. X-Ray showed thickening of the periosteum with increased density of the bone (Fig. 9). At operation a cavity, the size of a cherry, containing pus and granulations was found below the bicuspid. In this case there was no sinus. Uneventful recovery.

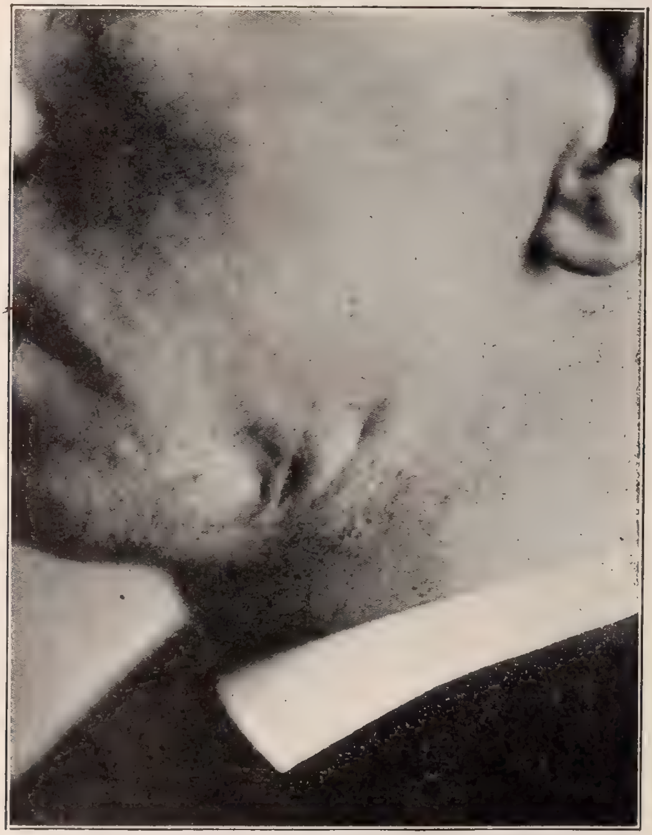

Fig. 10.—From photograph of Patient 11; sinus at angle of jaw.

Case 11.—A boy, aged 20, for ten months had had a discharging sinus which appeared spontaneously after an acute swelling in the region of the angle of the jaw (Fig. 10). X-Ray showed area of dense bone in the ramus suggesting a sequestrum (Fig. 11). At operation a small bone abscess was found in lower part of ramus.

Case 12.—A woman, aged 29, a few weeks before operation had the lower right bicuspid extracted on account of pain; six weeks before examination had three lower molar teeth extracted for same reason with no relief. Two weeks before examination incisor teeth were removed without relief. Right side of jaw began to swell five months previously; at times the patient had trismus and difficulty in swallowing. Examination showed lower jaw on right swollen and tender; remaining incisor teeth loose. At operation lower incisors were removed and sequestrum consisting of part of body removed through the mouth. One month later another piece of necrotic bone was removed from jaw near the median line.

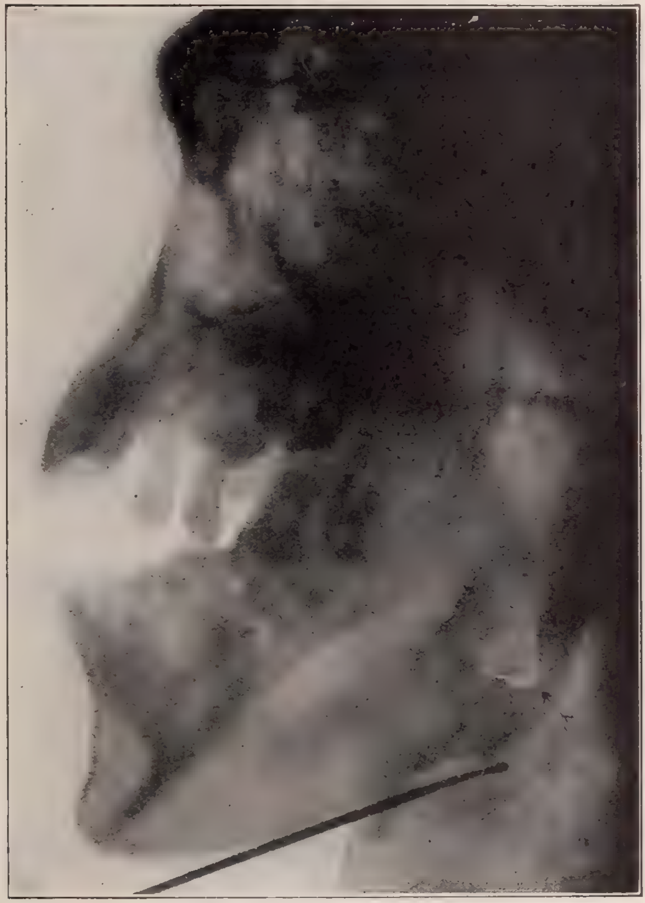

Fig. 11.—From X-Ray of Patient 11; note focus in ramus.

In closing I desire to thank Drs. Munro and Bottomly for the use of the clinic at the Carney Hospital and opportunity furnished for the study of their cases.

416 Marlborough Street.

ABSTRACT OF DISCUSSION.

Dr. Eugene S. Talbot, Chicago: Few physicians and surgeons are able to differentiate conditions due to diseased pulps, death of pulp with alveolar abscess and osteomyelitis due to other causes. There is not a stomatologist who, in his medical life, has not met many surgeons who know nothing of the subject. I could cite 15 or 20 cases in which surgeons have operated on jaws for simple alveolar abscess. The essayist, from his experience, can discriminate between these conditions, which is important in treatment. Patients with osteomyelitis due to dead pulps can be sent to the stomatologist and successfully treated, thus avoiding unnecessary mutilation.

Dr. George V. I. Brown, Milwaukee: Every point of this paper has been proved by slides. The changes occurring in the bone structure in degeneration and regeneration, and the cases illustrated are exceedingly interesting. I was called the other day to see a little boy in Nashville with congenital ankylosis, his jaw was very much drawn to one side, even more than the one shown by the essayist. In another case, a little girl of six with an ankylosed mandible, I operated and gave relief and she can now open her mouth; but I do not really know what caused the ankylosis in either of these cases. I would be glad to have the doctor tell us more of his conclusions, because his radiograph pictures are much clearer than any I have been able to secure.

Dr. Stewart L. McCurdy, Pittsburg, Pa.: In no case, especially in the suppurative stage, will it be possible to tell whether the disease was primarily periostitis or osteomyelitis. In ankylosis we will find a history of suppurative middle-ear disease. The disease extends into the temporo-mandibular joint and results in its destruction and subsequent ankylosis. That is the condition I found in a great many of these cases. The treatment is the removal of the head of the bone.

In the treatment of these cases I have removed half of the bone in one case and nearly two-thirds in another case. In another, the bone was denuded from the angle throughout its extent of the ramus, and I could pass a probe along the entire surfaces of the rami on both sides. Fifty per cent of these cases are specific, and repair will only take place under potassium iodid treatment. This was followed by readhesion of the periosteum to the bone and recovery under specific medication.

Dr. H. H. Germain, Boston: This man who had a fracture of the condyle had a double fracture of the lower jaw. The second one just below the region of the condyle was not discovered. The first fracture was treated, and he developed an apparent suppurative condition of the middle-ear. He had never had any middle-ear disease. This led me to believe that it was a condition following the fracture. I passed a probe down to the sinus anteriorly and felt sure that if I followed the sinus I would go down to the condyle. The condyle was found broken off and necrotic and was removed. He got a very good jaw, considering the fact that he had been suffering for four months. I do not think it is a fair statement that 50 per cent of cases of osteomyelitis are due to syphilis. Very much less than this, if any, is more nearly true.

How happy is he born and taught
That serveth not another's will;
Whose armour is his honest thought
And simple truth his utmost skill!
— Sir Henry Wotton

DENTAL LAWS.

By Alfonso Irwin, D. D. S., Camden, New Jersey.

(*Continued from page* 437, *June Summary*)

DENTAL COLLEGES

(a) No individual, combination of individuals, association or corporation, shall engage in the practice of dentistry under the claim of conducting post-graduate schools, prosthetic schools, schools of orthodontia, dental colleges or dental schools of any kind whatsoever, unless legally chartered as such under the laws of the *State.* Any one convicted of such offense shall be fined $1,000 for each and every violation of the law or six months' imprisonment, or both. Each partner or member of a school faculty, instructor, or any financially interested person shall be liable to the aforementioned penalty.

(b) No dental college shall accept as a matriculate any applicant who does not possess the certificate of an approved high school four years' course, or the entrance requirements for matriculation into the State University.

(c) All dental colleges shall be required to give practical and theoretical instruction in anatomy (including dissection of head and neck), anesthetics and anesthesia, biology, bacteriology and embryology, chemistry, comparative odontology, crown and bridgework, dental ethics, inlay technique, dental jurisprudence, materia medica, metallurgy, oral surgery, oral prophylaxis, orthodontia, physiology, operative dentistry, prosthetic dentistry, therapeutics, in so far as these subjects pertain to dentistry. Ten months or forty weeks of six days each, should be required for three successive years, or collegiate terms of study, in order to obtain a dental degree.

PENALTIES

(d) Any college convicted of setting aside its standard as published in its catalog, shall be fined $1,000 for each and every offense. Each member of *Faculty, each Instructor and Officer* of such institution shall be subject to these penalties. If this violation of standards is persisted in for three consecutive years, the dental charter of such college shall be annulled and its doors closed.

PARTNERSHIP

Dental parlors, dental associations, partnerships should be subject to the law the same as an individual dentist. Any one person practicing illegally therein should render the whole establishment liable to the penalties of the law.

DENTAL SOCIETIES

State Dental Societies organized for self improvement and promoting the welfare of dentists should be amenable to the law and its penalties, but should also constitute the advisory counsel to the Governor in all dental affairs and should be acknowledged as the official *mouth piece* of the dentists of the state, upon all questions pertaining to the dental profession.

ADVERTISING

Licensed dentists who advertise shall be liable to the following penalties: Fine of $100 upon conviction of advertising in violation of the "Code of Ethics" as adopted by the *State Dental Society.* One hundred dollars and three months' imprisonment for second violation; one hundred dollars, three months' imprisonment and revocation of license with disenfranchisement for a third conviction for advertising.

PROSECUTOR

The dental law should designate the prosecutor who should see that illegal practitioners of dentistry and all offenders of the law are held to account and punished for offenses committed within the state. Such prosecutors must be elected and appointed according to the laws, courts and legal usages prevailing in each state. A dentist should be elected *State Prosecutor;* to co-operate with the authorities of the state. Prosecutions must be conducted according to the laws for prosecutions of the *state.* In some states the Attorney General has charge of prosecutions, or the County Prosecutor, or the District Attorney, or some special provision must be made.

PROSECUTIONS

The efficacy of a law depends upon its execution. Some one has said, "We do not need more laws, but we *dō* need more law '*going around in boots.*'" This *fits* our case. A weak law vigorously executed is better than a good law weakly executed; but a *strict* law *vigorously* executed is *best* of all.

EXEMPTION FROM JURY DUTY

Dentists in *active* practice should be exempt from *jury duty.* It seems odd to have to point out to New Zealand as the first country which established this precedent by incorporating this clause in their law (1904).

REPORT TO THE GOVERNOR

Lastly and most important, is the report that should be rendered to the Governor of the state. The Chief Executive has the right to expect a concise yet comprehensive account of the work accomplished by the Board of Dental Examiners during the year, including a statement of the money received and disbursed. This is usually submitted December 31st, but the date should be arranged to suit the convenience of the Governor.

REMOVALS

The Governor shall, upon possesing sufficient written evidence therefor, properly signed, remove from office any member of the Board for continued neglect of duty required by this Act, or for incompetency, unprofessional or dishonorable conduct.

These are the most insistent points in a new dental law.

THE IDEAL DENTAL LAW

ELIGIBILITY

First: Let us take up again some of the more important points just enumerated. The Ideal Dental Law should exclude any member of any faculty, or any one identified in any way, shape or form, with any dental college, from becoming a member of a dental examining board in the United States. The reasons are obvious. Collusion between the members of the examining board and certain dental colleges; favorites would pass the boards; merit would not be the test of fitness. The verdict to be pronounced by the Board of Dental Examiners stimulates the faculty and student to do their best, while the examiners must be *just* or take the consequences. The Nebraska law providing that three dental examiners shall be present at the examination of the graduates of the Nebraska College, makes a *farce* out of the whole proceeding. There should be no mixing up of faculty and examiners at a dental examination. We recommend for your favorable consideration the following excerpt taken from the dental law of the Philippine Islands.

Section 1. (Referring to the appointment of dental examiners) "and provided further that no member of the faculty of any school, college or university in which dentistry is taught, shall be eligible for appointment on said board." Or the California law which is as follows:

Section 2. (Providing for the appointment of "A Board of Dental Examiners to consist of seven") 8th line, "and none of whom shall be members of the faculty of any dental college, or dental department of any medical college in the State of California, or shall have any financial interests in any such college." The said seven (7) shall compose the Board of Dental Examiners of California.

States excluding faculty members from a Board of Dental Examiners are: California, Illinois, Kentucky, Massachusetts, Nebraska, Nevada, New York, Ohio, Pennsylvania, Utah, Virginia, Wisconsin and Porto Rico. Notice that all the college states except District of Columbia, Iowa, Tennessee, Texas, Mississippi, Missouri, Minnesota and Washington contain this proviso.

PERSONAL CHARACTER OF EXAMINERS

During seven years' contact with the dental examiners of the United States, we have found them to be practical men, men of wide experience, broad views and receptive minds. Many of them are men highly educated, some have been professors in dental colleges and one occasionally leaves the rank of examiner to enter into collegiate work. They are conversant with the needs of their commonwealth, competent to pass judgment upon the fitness of candidates to practice dentistry, and prompted by a desire to DEAL justly with the applicants, the colleges, the dental profession, and the public. Many dental examiners serve *without compensation,* prompted doubtless by *love* for their profession. We cite this estimate of the character of the dental profession, because it is practical proof of the wisdom of enacting dental laws, and providing for the establishment of Boards of Dental Examiners throughout the United States. The work of the examiner is the *vindication* for the creation of said boards. New dental laws should continue to provide for their appointment.

ELECTION

Second: The ideal dental law should stipulate first, last and always, that the State Dental Society *shall* elect the members of the Board of Dental Examiners, in conjunction with district societies, each geographical section being rated according to population, and representation from local societies; and that the Governor of the state shall appoint those whom the dentists elect through their state organization, as the legal Board of Dental Examiners for the state. This should constitute the basic principle upon which your dental law should rest. Without this fundamental principle incorporated in your law, the work of your Board of Dental Examiners will prove unstable, unsatisfactory and even chaotic.

This elective prerogative, which rightfully belongs to the dentists of the state, will then be out of the hands of the politician, and placed in the hands of the trained expert, who knows what his specialty needs and who the dentist is who is best qualified to fill the position intelligently for the commonwealth, with justice to the applicant, and fidelity to the profession.

This stipulation is no reflection upon the Governor of any state, for if he is the right kind of a man he will be glad to have the choice made by the men most competent to make it. It relieves the Governor both of the *onus* and the responsibility attached to rendering decisions which properly belong to experts. A wise Governor is willing that the physicians, druggists, lawyers, preachers and teachers shall regulate their own "little family affairs," according to their own experience, training and education. Why should not the same privilege be granted to dentists? The new law of Australia (New South Wales) makes this mistake of placing too much of the responsibility of the law upon the shoulders of the Governor. Let us not repeat this mistake. Again, the dental profession of a state bears the expenses and blame, as well as doing all the work of establishing and executing dental laws, why should not this entitle it to the right of electing its own examiners? A constituency of one thousand seven hundred and seventy-six voters ought to be worthy of consideration even by a Governor. If the state assumes the responsibility, performs the work and defrays the expense then the situation changes.

OFFICERS

The Board of Dental Examiners should be authorized to elect its own officers, make its own rules, specify the legal requirements to be exacted from candidates for a license to practice dentistry not provided for in the law, aided by the advice of competent legal counsel. It should constitute the sole *judges* of *standards* of preliminary education and the reputability of all dental colleges; name and dates and places of examinations, which should be adapted to both practical and theoretical tests of the applicants' fitness to practice; and arrange all the details of its work without fear or favor, dictation or coercion.

APPLICANTS

All candidates should be citizens of the United States, possess a certificate declaring that the possessor has completed four years' course of an approved high school, or its equivalent. He should possess a dental degree from a reputable dental college located within the jurisdiction of the United States of America. He should be twenty-one years of age, of good moral character, free from any infectious or contagious disease of a chronic or dangerous character. The deaf, dumb, semi-blind, maimed, chronically or incurably diseased, or those afflicted by a contagious disease, or the quasi-incompetent and ex-convict, should be barred from becoming a candidate for a license to practice dentistry. He should be required to produce a recent photograph of himself, and supply an autobiography covering not over five hundred words, giving a complete record of the leading events in his life. This record will be of value to the board for reference in after years, as well as a practical test of his penmanship, orthography, composition, general intelligence and literary ability.

LOOPHOLES

Beware of loopholes! Makeshift provisos! Exemption clauses! They are pitfalls into which you will stumble at the most critical time. They are like the sword of Damocles, forever hanging over your head, suspended by a mere thread and ready to drop at any moment and cleave your skull in twain. They are boomerangs which return to plague the life out of the dental examiner and the constituents whom he serves. You find a case in your state, which the exemption clause just fits and you congratulate yourself upon the far-sighted wisdom of the incorporators of your dental laws, only to find that some specious reasoner, some crafty agitator, or even an ungrateful beneficiary of this exemption favor act, as well as keen lawyers and matter of fact courts and callous juries, have made use of these concessions to nullify the object of the entire legislative enactment.

(*To be continued*)

GOLD AS A FILLING MATERIAL

By J. V. Conzett, D. D. S., Dubuque, Iowa.

(*Continued from page* 431 *June Summary.*)

DISCUSSION

Dr. T. B. Johnson:—It usually adds interest to a paper and enlivens the discussion, to pick out a few real or imaginary flaws in it, and then show the author the "real thing."

In reading over this paper carefully a number of times, I have been unable to discover a real flaw and my imagination has failed utterly to dig up any other kind.

In fact, I don't believe I could do the audience a greater favor than to read it again just as it has been given, for it will bear repeating over and over.

The dominant thought, however, to me is—After all, what is there that beats a *good* gold filling?—accent on the good.

We have had a procession of substitutes in the past, have them now and will have them in the future, good, bad and indifferent.

Some of them come in with a rush, overshadow gold for a while and then, like the latest product of some of our base ball pitchers, "fade away."

Amalgams, Cements, Porcelain, Gold Inlays, Silicate Cements, etc., but nothing yet has proved its right to supplant the *good* Gold Filling.

Of course, the *good* is the nigger in the wood pile but the paper shows us how to get him.

There is nothing more nearly true in the whole paper than the statement that success depends on the skill of the operator and that this skill comes only by hard and persistent effort. "Some men are born great, some achieve greatness and some have greatness thrust upon them," but a good gold worker isn't an accident of birth or the product of a thrust—he's an offspring of industry.

After believing that I had been practicing dentistry for the last twelve years it has just recently dawned upon me that I am just beginning to commence, and one of the first things I intend to do is to learn how to use non-cohesive gold, so far a total stranger to me.

If I had put in my spare time in the last twelve years in learning to manipulate gold in its different forms instead of monkeying with substitutes, I might have been spared a telephone message which reached me just a few minutes before I left my office yesterday afternoon.

Mrs. X—, for whom I had recently finished some dental operations (that is, all but receipting the bill), on the other end of the line——

"Hello, Doctor!—how long will you be in your office?"

"I'm just ready to leave and won't be back for a week."

"O dear! that's too bad—you know that last porcelain inlay you put in for me"—"y-e-s"—"well, it's loose, and I wondered if I couldn't come in just before you go home and have you cement it in again—it won't take long"—She'd been there before.

In a subject as broad as this there are always a number of little puzzling details which can't possibly be explained and I earnestly wish that the essayist could have his wish and talk to us with his hands as well as his mouth, for that would wipe away many of the little cobwebs that otherwise remain.

There is one little point which may not be bothersome to others but is to me and I would like to have the essayist enlighten me if he sees fit. I have been reading in the newspapers about "hypothetical questions" and while I'm not sure that I know what this means I would like to ask a hypothetical question on this "extension for prevention" proposition.

Suppose you were practicing dentistry in a humanitarian village where the one great and supremely necessary thing to be accomplished was painless dentistry, and you were confronted with a very sensitive cavity, in a very sensitive tooth, in a very sensitive mouth, in a very sensitive patient and so on and so on, and you had tried your fool proof cataphoric outfit without results, your high pressure syringe and failed, your gas and oxygen and the patient wiggled away from you, Christian Science, hypnotism, moral suasion, even good old carbolic acid and hot air, and still fell down—to quote a classmate of mine—"How the h—— would you extend it?"

DR. F. J. SPARGUR:—Dr. Conzett has given us a most excellent paper. I gladly accept the opportunity to discuss it for the reason that I am always looking for an opening to get in my endorsement of gold foil, and gold foil and tin in combination as filling materials par excellence. Dr. Conzett has come many miles to tell us things about operative procedure that most of us have known for a long time. Vigorous papers of this sort are a needed stimulus to the busy dentist in his effort to attain the ideal. The dental profession as a whole gladly, I believe, acknowledges the merit of the Black method of preparation and filling of tooth cavities, and applauds the vigorous manner in which our friend, Dr. Conzett, and his colleagues of the west carry them out in their work. I am not willing to concede, however, that good cavity preparation and the proper manipulation of filling materials is confined to any one man, any one group of men, or to any one section of our country. Men of the east, south, north as well as west have been making excellent fillings for fifty years and more, many of them before Dr. Black's methods were known. Dr. Black has, however, done a great work, and we of the east most gladly acknowledge it. We welcome most heartily Dr. Conzett and his paper. We need papers from men of his spirit to help combat the too-vigorous inlay tide. Clinging to the old until the new has been tried and proven has no retarding effect upon the profession's progress.

I have no special methods in the manipulation of foil that I wish to bring out. I am an advocate of tin foil wherever it can be used without coming to a wearing surface—the more the better, and Number 60 gold foil for the remainder of the filling. A former speaker says that he uses the number 60 foil to start the filling and continues it throughout. In his hands that way may be best—but it would not be in mine. A difficult filling to finish at the cervical border and with doubtful efficacy as compared to tin. Dr. Conzett advocates the use of a saw in trimming cervical margins. In my opinion a close fitting matrix, a margin of well condensed tin, a thorough burnishing and finishing—a very little is necessary if building and burnishing have been skilfully done—more perfectly insures a perfect joint. After all it is the man behind the method that counts. Cohesive gold, soft gold, tin, and the much discussed inlay all have their adherents. Beautiful and lasting results are accomplished by careful operators with any of the methods and materials used. Failure is sure with a careless man behind the gun. What the profession needs today more than she needs new material or new methods is painstaking manipulators of the many excellent means that we have in plenty. If I may be allowed to do so, I would like to leave with you as the burden of my discussion of Dr. Conzett's paper this trite truism—"Operative excellence is only attained by those who have the ability to take infinite pains." Methods and materials will fall into the back ground and take care of themselves.

DR. PRICE:—I want to take this opportunity to say that I think there is no conviction in my heart stronger than the conviction that the key-note to our success is in the title to this paper. Gold as a filling material will be the key-note of the conventions for five, or ten, or twenty decades to come, but I want you to know that the malleted filling is not necessarily the only line in which Dr. Conzett excels. Dr. Conzett is a member of the Inlay Club, composed largely of "Black" men of Iowa. Gold as a filling material has a different aspect, entirely depending upon the fixed conditions under which we are using it, whether inlay or malleted. When we are considering the preparation of a cavity for a malleted filling, we have learned of such men as Dr. Butler that there are certain underlying laws and principles that must be followed,—we might term them fixed conditions. The strength of the tooth, the behavior of the gold, etc., the cavity is to be prepared to adapt itself to the fixed condition of the filling material, and we are having today very high perfection in the gold malleted filling. But my conviction is that ten and twenty years from now when the subject of gold as a filling material is brought up, it will not be gold as a malleted filling material, but as a fused filling material. When we have learned to handle the fused gold as we have the malleted gold, we will then have the fixed condition adopted to which we have not today. I say the man who will not adapt himself to the fixed physical conditions will not make this high ideal with gold inlays. And I want to say that the man who is doing this—making good fillings with malleted gold, when he exercises the same extreme care with the fused gold, will produce just as good, and, I am convinced, better operations with the gold inlay. There are many cavities, because of their location, that make it imperative that we use the cohesive, or non-cohesive foil, but we must study and satisfy the fixed condition.

Dr. N. S. Hoff:—Dr. Conzett has certainly brought us such a pleasant message, so plausible and true that I have no disposition to add to it or disagree with it materially. While listening to the reading of the paper I found myself making comparisons as to the merits of the several methods and also of other fillings with that of gold foil. The essayist and Dr. Johnson agreed heartily and cordially that there is nothing like a good gold filling. Of course we all make good gold fillings (I do not know of anybody who makes bad ones) I never made any—never tried to make any bad ones in my life—always try to make good ones. But the essayist says "there are very few good gold fillings made." I can't agree with this statement though he may be right in this as he is in many other things in the paper. I believe there are lots of good gold fillings made. I can show you some. I have seen them made by men in this audience, in Toledo, Cleveland and other parts of this State. There are a lot of good gold fillings made, and I do not know but this is the reason we think there is nothing so good as a gold filling. There is nothing that has proven itself so valuable as good gold fillings, and even some of the bad gold fillings have done excellently in saving the teeth for a time. It is my observation that gold fillings as a rule preserve teeth better than almost any other filling material. It is early perhaps to make a statement of this kind, because we have not fully tried out the other materials in the same way that we have gold. It has been our ideal; we have put our best technical efforts in it. We have spent time, effort and thought on it; so that we have made good gold fillings, and we have mastered the technique of the material. I do not think we ought to attempt a comparison with other materials until we have had more experience with them and have tested these materials as fully and conclusively as we have the gold.

Some of the technical features that Dr. Conzett has brought out, I know are scientifically correct, and we cannot consistently make serious objections to them, but there is a whole lot that might be said in regard to the different methods of manipulation—the different methods of manipulating foil and the kinds of foil we are manipulating. The man who uses one kind of foil will, as a rule, succeed better with his individual method of cavity preparation, the kind of instrument as to size, shape and so on; he has been accustomed to using these things in such a way that he can make just as good filling with his kind of cavity filling or foil as Dr. Black or Dr. Conzett will with theirs.

The thing which Dr. Black and his followers have done is that they have scientifically systematized this operation and put it on a scientific basis or technical principle. Most of us have stumbled in our method of using gold foil. We have forced ourselves to use it in our own particular way. It is like playing the violin or piano; some men will pick it up by ear and make good music, but they have no well grounded method; they perhaps have had no teacher who has trained them why they should do it so and so, but they play pleasingly and entertainingly to us and we enjoy the music. It is the same with a good deal of our work. We have not always followed the scientific principle. Perhaps it has taken us longer to become expert than it should if we had had this scientific outline of cavity preparation, etc., that Dr. Black has worked out for us. The dental student of today who has the advantage of beginning with these definite methods of cavity preparation of the filling of teeth, has an immense advantage over some of the men long in practice.

I remember when Dr. Black published his first paper on how to treat enameled margins. I read it over and I came to the conclusion that there wasn't anything much that was new in it except that he had systematized our ideals and technique and defined the practice that many of us had worked out in our own ways by force of circumstances. Formerly we were not taught these things on the scientific basis, but by demonstration, and so I congratulate the young men of today that they have a definite easy basis of procedure that will ensure excellent results. That is the reason why we had only a few men in former times like Drs. Butler and Ambler who were expert operators. I have also seen beautiful work come from the hands of men who are not widely known in the profession, who could make excellent operations merely from reading, thinking and faithful efforts. We are now doing these things because we have the benefit of Dr. Black's work, that has been done and put in such shape for us, that we can appreciate it.

I presume there are some things in the paper before us that we all could take exception to. The essayist does not use the same kind of foil that I do. He discredits the starting pit. I use a starting pit all the time. I use No. 60 foil, and must have a definite retention form as I cannot use No. 60 foil by the wedging method. I have to have a position anchorage to start from, but I do not drill a deep pit in the dentine. My starting pit is only slightly deeper than it is wide. I have seen some of the modern cavity preparation in which I think more of the tooth was cut away than I find desirable with my preparation. I do not find it necessary to make deep grooves in the dentine, such as will threaten the pulp or cause sensitiveness. I like the idea of the essayist in making cavity walls parallel, so do I, but I must have a retention pit to start from, instead of a broad or a dovetail base, because the first piece of gold that I put in must be there for all time. I do not mean that it shall move afterward under any consideration; if it does, my filling is a failure. When my gold is started it is there permanently. There is no great difficulty in manipulating the kind of foil I use and it has decided advantages. There are other methods. I have tested tin foil, soft foil, mat gold, etc., in order to expedite my operations, but I invariably go back to the No. 60 foil, and when I get through I know that I have got something that is going to be there when I look for it again.—It won't be like the porcelain Dr. Johnson told us about.

Another point in the essayist's paper that struck me forcibly was the fact that a great deal depends on the wedging of the foil next to the cavity wall, as that is an essential. This is the method of hermetically sealing the cavity. With the thinner numbered foils, 2, 4 and 6, I do not know how it is practicable to pack the gold expeditiously and weld so many surfaces together and drive all the air out. With the number 60 foil we have only two surfaces to weld where you have perhaps 20 to 30 when using Nos. 2, 4 and 6. You say that you cannot adapt the heavy foil to the walls of the cavity because it is so stiff and unyielding. There is no trouble of this sort experienced by anyone who will learn to use it properly. It is the nicest foil to adapt to the walls of the cavity. It doesn't rebound when malleted, and there is no air under it, and so we build right on up. I never knew until recently that the walls of the dentine of the cavity were elastic, this makes our gold filling more securely anchored. I have often wondered how it was possible for the filling to become impregnated with moisture. The fact has been brought out here that it springs or gives under the malleting force. I have always thought that the walls of the cavity did not change position at all and that there was no possibility of wedging it apart. I do not know that the old operators were able to expand these walls with their hand pressure instruments, but they made closely fitting joints. With me, I have had no difficulty in adapting foil to the cavity wall, and so I have had no great difficulty with failures on that account.

It seems to me that we will all have to recognize the fact that in the gold foil filling we have our standard set for us. It is the only reliable sheet anchor and we must hold on to it. We must not lay our pluggers aside and take up with the other things that are coming on, until they have proven to us that we can depend upon them. So I am glad the executive committee has given this subject a part on the program, and had so excellent a man to present the subject to you, because it seems to me it is the only thing that it is safe to rely upon.

Dr. Broezel: I am very heartily in accord with what Dr. Conzett has said. With the exception of one thing I agree with him, and that was the point that Dr. Hoff spoke of, the habit of making under-cuts. I make under-cuts without weakening the tooth. I have no criticism to offer of the material he uses. I want to mention one thing Dr. Hoff spoke of. In the first place I think he threw some slur upon the use of fine foil; that you could not make solid fillings; that the particles of foil would be separated by air. I do not believe that and I do not believe you do either. I have seen many a filling made with No. 4 foil, and when we had occasion to take it out it would be a solid chunk and you could not separate it. There are no layers of air in it at all. I maintain that solid fillings can be made out of soft foil. I will not dispute what he said about the use of 60 foil. I never use it and I am not competent to judge. I have used it only for finishing surfaces where I wanted a surface that would stand abrasion. I would like to have Dr. Hoff explain more fully the technique of using 60 foil in the bottom of the cavity. I know I should leave a space there if I were to try it.

Dr. C. R. Butler:—I must say in the first place that I am very much interested in the paper that has been presented by Dr. Conzett, and perhaps to emphasize what he has referred to in regard to Dr. Black and his satellites, Dr. Hoff has said it better than I can say it, that Dr. Black has systematized certain procedures so that a larger number can produce better results than could be worked out, or obtained by accident and otherwise. Certainly that is to be commended, because a larger number are able to give to the people better operations than could be obtained a few years ago.

I have had the pleasure and advantage of seeing Dr. Wedelstaedt and his co-worker, Dr. Searles. If Dr. Searles pursues Dr. Black's mode of cavity preparation, I do not agree with him. I do not agree with any man who cuts away a large amount of the good solid tooth substance, making a cavity to fill with gold. I do not believe that is the highest ideal of tooth saving.

Dr. Webb obtained great celebrity as a manipulator of cohesive gold, and his method of cutting very liberally was that it was an easy matter to introduce his gold and produce contour fillings such as are considered ideal in these days. But, as I say, I do not believe Dr. Webb's nor Dr. Black's method, nor any other man's method that cuts away a large amount of tooth substance for the convenience of packing gold, is the highest ideal of tooth filling. We have had a large amount of that work done, yet I do not believe it will exceed—as far as the salvation is concerned—the work done by those who cut more sparingly.

In the matter of introducing the gold and then cutting it with a saw, I am somewhat of Dr. Spargur's opinion, that that is not the best way to proceed. I believe that if we are experts in the manipulation of gold and the introduction of it that it can be placed in a cavity and bring up restoration, something as the sculptor does in making up his model. He endeavors to make it so that it requires very little trimming to the complete finishing. So in the manipulation of gold, it should be introduced in such a manner so that the final finish is a very small part of the operation. Some men are very particular about the amount of gold they put into the operation; never want to waste any and they fall short of putting in as much as they should and take too much time finishing.

Dr. Jackman:—I want to say just a few words. Some years ago I became acquainted with Dr. Conzett, and have always found him to be a gentleman and a man who understood dentistry better than the average dentist. It has always been a pleasure to me to know Dr. Conzett. I want to cite a little instance previous to bringing out the point I wish to make and that is this. Four years ago last February I was invited by the G. V. Black Club to attend its meeting in St. Paul. While up there I desensitized a tooth which Dr. Conzett afterwards filled for a young man 17 years of age. He was thoroughly scared. He said to the gentleman who had charge of the clinics. "I am afraid I shall be hurt. I have neglected my teeth so long because I was afraid to have them filled. I don't think I will remain." I went up there to demonstrate high pressure anesthesia. I said:—"Stay, you will not be hurt." He remained and when the doctor was ready I desensitized the tooth. The doctor went ahead and made as pretty an operation as I ever saw. I never saw a better one and the patient was not hurt at all. The doctor stated that we should follow the fissures to the end. That is something that the average dentist does not do. You can do it without any nervous strain to yourself or to your patient if you first desensitize the tooth. You can prepare that tooth as perfectly as your skill will permit you to do it. We may practice painlessly, and if we have the skill that Dr. Conzett has we can fill the tooth as perfectly.

The paper is splendid all the way through. I am sure if we read it and re-read it, we will be helped every time.

Dr. Conzett:—This is not at my suggestion at all. Dr. Price asked me if I could and would do this. I am here entirely at your disposal and your pleasure, and whatever I can do to demonstrate methods which our great master, Dr. Black, has taught us, I am glad to do. I know that the points of difference between you and me will fade away when we understand one another. The methods which Dr. Black has given us are perfect methods, and the only reason you do not believe that is simply because you do not understand the method. You are just exactly where I was ten years ago because I did not believe the things that Dr. Black and his disciples taught at that time, until I went and put myself immediately under his supervision and of the men who were teaching under him; then I knew where I was working and I found out that I had had a misconception of his methods.

There are men who cut too far. We must cut only far enough to bring the filling into safe territory and never farther. When we go farther, we are doing an injury.

I want to take off my hat to the old men, Dr. Harroun and Dr. Butler and some of those men who are adepts. We are coming back to the principles that they taught,—the use of soft foil. I do not believe that there is any material that is a better tooth saver than soft foil. It is simply a non-cohesive foil. Should that distinction be made between the non-cohesive and cohesive foil? One is as soft as the other, but non-cohesive foil is made non-cohesive by the deposition of gas of ammonia on the surface. Just as soon as that gas is dissipated, as it is when annealed, then that gold is presented to us in its virgin state and becomes cohesive. We use the non-cohesive because the one surface slides upon the other and we have a perfect adaptation to the walls of the cavity. There is nothing inherent in gold that saves the tooth; it is simply that the gold prevents any ingress of fluids and micro-organisms. We know that there are substances which become condensed upon the surface of the gold and will make that gold perfectly non-cohesive. We know that there are foils on the market today—I have no doubt that Dr. Harroun has used such golds and perhaps still uses those, which are perfectly non cohesive. Abbott makes one, and I believe Hood has one that you cannot make cohesive. The only way that you can make it cohesive is by melting it down and again making a foil from the melted ingot. We can make gold perfectly non cohesive by condensing carbon dioxide upon its surface or something else which forms a film upon the gold which will not volatilize with heat. We may have upon our tray gold that may have, deposited upon it, some substance which will make it non-cohesive; we may deposit upon the gold some substance which will cause a discoloration of the gold when it goes into the mouth, or we may cause such a deposit by using an imperfect open flame to anneal the gold. In order to avoid that possibility use the form of gold which comes to us in the No. 4 non-cohesive soft; that which has been made non-cohesive by the deposition upon its surface of some chemical, which protects the surface of the gold and that is volatile in the presence of heat.

I presume it might be well for me to take up some of the points which were brought up in the discussion. One man asked me how I would extend a cavity that was sensitive. I would say that I rarely have a patient that I cannot control in the extension of a cavity. I have little difficulty in the preparation of cavities. Maybe it is because we have better patients out in Iowa. I remember the case to which Dr. Jackman refers, and I wanted to apologize to Dr. Jackman for not speaking of that at the time, but the fact was that I was out of the room at the time that the clinic was reported. He did perfectly desensitize the tooth for this young man, and I immediately ordered a high pressure syringe, but I have tested it very little simply because of my lack of ability to use it, perhaps because I hadn't sufficient necessity for using it to learn its proper use. But I certainly will use it if I find a cavity such as the gentleman described which was so sensitive that it could not be touched. That which I had rather do, would be just to cut it out far enough to take out the decay, and then fill with an oxy-chloride of zinc, and dismiss the patient for six months; when I would be able to fill that cavity with much less pain.

I want to correct a misapprehension. Dr. Hoff said that I said there were very few good gold operators. I might think they are *comparatively* few. There are a good many dentists but there are comparatively few good gold operators. I will stand by that. When we understand the proportion of the men who are operating by the Dr. Black method,—and when we see the operations that are made by the majority of men in the profession, in comparison with the operations that are made by these men, there are very few good gold operators.

Very frequently you will see it stated in the journals that the average life of a gold filling is three years. If that is true, I want to say that the average man is a mighty poor gold operator. The average life should be just as long as the tooth lasts.

There are so many things to be taken into consideration in the perfect filling of a tooth. It is not only in the preparation of the cavity; it is all the conditions which enter into the making of a good filling. We must first study the conditions; see how far the tooth is decayed; understand the occlusion; the degree of susceptibility or non-susceptibility, and then we must lay out the lines of the cavity, condense our gold and make it along the lines indicated by our study of the conditions. And the man who fails to do this is not a good operative dentist. But the man who studies and understands the conditions, is a good operative dentist in the making at least.

Dr. Price said that I was a member of the Gold Inlay Club, and that is true. I said in my paper that it had come and had come to stay. I believe it has a large place, and will have a large place in operative dentistry.

I believe that the reason there has been such a hurrah for the porcelain, etc., is simple because they have utterly failed with the gold filling in the past. But the man who has perfected his technique with the filling of gold, will not be in a hurry to throw away his gold pluggers.

I want to send out this word of warning: There are many failures coming to us today, and there will be a larger number of failures coming to us in the future by reason of faulty insertion, because they are not extending the cavities, and in a cavity that is not extended there will be a recurrence of decay.

I think that Dr. Hoff and I agree in the matter of pits. I do not think that he would allow his convenient point to degenerate into the pit. It is all right to use a convenient point—just a point which you may find convenient in which to start the filling. It is all right to have a convenient point, but I do not believe in the cutting of grooves or pits; because what is the use of cutting away any more tooth than is necessary. It is not necessary for retention to cut that pit or groove to the extent that you weaken the tooth. There is a tremendous elasticity of the dentine. It is impossible for you to push that gold out, by reason of the fact that the condensation of the gold under mallet force, causes the dentine to give under the pressure, and the elasticity of the dentine upon reaction hugs the gold so firmly that it is impossible to force it out of the cavity.

I have no criticism of the man who is successful with the use of any material. Dr. Hoff is an artist in his line. He can use the No. 60 foil, and would be a foolish man to throw it away and use something that I, or somebody else, would recommend. He has learned to use that, but I believe it is more difficult to use the No. 60 foil than the No. 4. He has used that successfully because of his degree of skill, but I believe you can very much easier use the No. 4 foil, and I am sure that you can very much more perfectly adapt the soft foil to the margins than you can the No. 60. However, that is a matter of the personal equation. I am a firm believer in the saying of the Apostle—"Prove all things; hold fast to that which is good." The thing I have found to be good I am going to hold to. Dr. Hoff has found 60 foil in his hands good, and will hold it fast, I have no doubt.

The gentleman who followed Dr. Hoff criticised the method of finishing the filling. One of the strongest points of the Black method is the finishing of the filling. You can do in five or ten minutes that which by the old method would take an hour. I would take a cavity—and I am not an exception,—perhaps I do work more rapidly—and from start to finish, from the time the patient gets in the chair it will only take an hour. And that includes the preparation of the cavity and the finishing of the filling. So you see it does not take a long time. There is no harm done in the sawing out of the gold from the gingival portion of the filling if the gold is perfectly adapted. I can readily see that it might work to a serious disadvantage if a filling of tin were used in this way. I would not use tin because there is always a black line and because it is a difficult material to finish; and I would not use it because I have seen so many failures in its use.

I never would use a matrix in the making of a gold filling. The very points that we are trying to get around are done away by the use of the matrix. We have the shape of the cavity, and when we place our cylinders in this form, we want them to come beyond the margin, and it would be impossible to place them beyond the margin if the matrix were used. We use our cylinders in quarters and halves. The size should be longer than the cavity so as to allow a portion of the cylinder to stick out beyond the cavity. It is rolled on a hat pin or any convenient form until it is in the form of a cylinder. This cylinder is then placed in the lingual gingival angle and in the buccal-gingival angle of the tooth, and another cylinder is placed in between these two, the end sticking out into the interproximal space.

These cylinders will fill enough of the tooth to bring the filling up to near the occlusal step. After this the cohesive foil is built upon and over the non-cohesive and anchored in the occlusal step. The saw is placed in here and we never saw beyond the contact point. As soon as you saw beyond the contact point you have the ingress of food, and all those sorts of things.

Question:—Do you separate the cavity?

Answer:—I separate the teeth. Nearly always do it by obtaining previous separation. The last thing that I do is to separate the teeth enough to use a steel burnisher and burnish that contact point.

Question:—How do you get through the cervical border?

Answer:—We cut enough of this gold away with the Black knife to insert the Black saw. A Kaeber saw with the back ground down to the thinness of a hair is used in the Black frame. We are able to introduce this in the interproximal space at the gingival, and we saw out the gold from the gingival surface down to the contact point. After the cavity is all complete—after we have the non-cohesive foil placed in the cavity and the cohesive foil which has its retention in the occlusal seat, we mallet the non-cohesive gold into the cavity from the proximal surface. That is before the sawing. Frequently the malleting of the gold into the cavity is all that is necessary to enable us to introduce the saw and we do not have to use the Black knife.

Extension for prevention is misunderstood. We have thought that there was no more controversy on that—that everybody understood our position in regard to extension for prevention.

It is foolish of us to just cut out the area that is decayed and not change the conditions. When a patient comes to us with decaying teeth and we know it is caused by a condition which is abnormal, it is our duty to make that condition one which will not make for decay. We know that micro-organisms place themselves upon teeth in protected places, and we are going to have decay whether there is a filling near them or not. So in the old method of filling teeth where the cavity occurred in a proximate surface of a tooth, we just cut it far enough to cut out the decay; we found that the decay was occurring again gingivally, and still we could not bring it out to a point where it would exclude food, and we would have a recurrence of decay. It is because we have not corrected the condition. I do not believe in cutting any further than is necessary, but I certainly do believe in cutting as far as is necessary. If we do not cut it far enough and our patient has a recurrence, the patient is worse off than if we had cut it far enough in the first place. But there is no excuse for cutting away the tooth for extension for prevention. The margin of the tooth should only be cut far enough to come out into self cleansing territory, and we can limit our cutting by making our contact points—simply making all the lines of the cavity slope towards that. Do I make myself clear on that?

Q. How is the saw inserted?

A. The blade is taken out of the saw frame and inserted at the gingival margin from the buccal surface; then the saw frame is placed on the saw after it is placed in the mouth. The back of the Kaeber saw is ground until it is just as fine as a hair.

I am sorry I did not bring my instruments. I would have been glad to make a clinic.

Q. Suppose you have a case of a small cavity at the contact position in the proximal surface; how far would you extend it towards the gum line?

A. I would extend it far enough to allow the gum tissues to come up and protect the margin of the filling.

Q. Do you do that without regard to the indenture beyond the cavity?

A. Yes, There are a great many cases come to us in which the gingivæ has been forced so far back that the cementum is exposed. As we restore the conditions and watch the case, we find that the gum will come up there and cover that in the majority of cases. I have a case where the teeth have been taken out. The teeth came nearly together, and I have built across that place and the gum tissue has come up and hugged the filling. It should be carried gingivally far enough so that the gum tissue will come up. I do not believe that a filling is perfectly made that does not restore the mesio-distal diameter of the tooth. The filling may be perfect—the conditions may be perfect, but unless the mesio-distal diameter of the tooth is restored, I do not believe that the filling is a success.

First, get sufficient separation so that you are able to restore the original condition of the tooth, cutting just to contact point of the filling leaving the space in the end in a normal condition, and you won't have any trouble about your gum margins.

Q. What do you call a reasonable limitation with the use of the foil as a filling; to what extent do you remove the cavity?

A. There are a number of conditions that have to be taken into consideration there: The condition of the patient, the condition of the tooth and the personal equation of the operator. Some say no tooth should have an inlay in which a gold filling can be made. That is not absolutely true because there are a great many cases in which a patient cannot stand a gold filling, and in such cases I think an inlay should be used.

As I have said, and I do not hesitate to repeat, that every man must be his own judge of the material that he is going to use in the teeth that comes to him. If you feel that you can save a tooth best with gold filling, then use gold filling. If you feel that you can save it with inlay, I believe you would be doing an injustice not only to the patient but to yourself by using gold filling.

I believe that the operative dentist who is worthy the name is the man who can use gold, the man who can use porcelain, the man who can use the gold inlay. I attempt to use them all to the best of my ability. I have very little patience with a man who says that there is but one material to use and condemns every body else because they do not use that material.

There are cases in which we use the non-cohesive foil; we make a box-shaped cavity, cutting out the fissures and making a perfectly flat seat; the cylinders are placed on the edge of the cavity, standing the cylinders on end all around the wall of the cavity; the cylinders sticking out of the cavity. They leave a space as they are condensed against all the walls of the cavity. What the old operators used to do with hand pressure, they do with strong instruments. They are able to get a great leverage, and they condense the soft foil perfectly around the margin of the filling, leaving a central pit which the old operators used to use. It is forced down into this central space. It is more difficult to do than the method we use. We fill this central space with the cohesive foil and then go over the entire occlusal surface, cohesive and non-cohesive and mallet in place.

Just a little while ago a gentleman sent me a filling in a tooth made some forty or fifty years ago, made by the non-cohesive method, and it is just as perfect today as it was the day it was inserted.

THE least sentimental, the most profoundly practical teaching known to man, that working principle by which all mankind may live and through working together develop itself to the uttermost possibility, is none other than the Golden Rule.

—Ray Stannard Baker.

EDITORIAL

ADVANCEMENT OF DENTAL EDUCATION

WE ARE glad to see further effort being made to advance dental educational standards and requirements. Last year at the time of the National Dental Association, at Denver, there was organized a Dental Educational Council, composed of fifteen delegates, five appointed by the National Dental Association, five by the National Association of Dental Examiners, and five by the National Association of Dental Faculties. The object of the organization is for the advancement of dental education and the unifying of the standards of the various national bodies of the dental profession.

From the membership of the council five have been appointed a committee on Colleges, five a committee on Curriculum, and five a committee on Uniform Dental Legislation.

The Committee on Colleges will visit the various colleges under the jurisdiction of the council with a view of ascertaining the character of the work done, including preliminary education, and whether the needs of the community in which each college or colleges exist are fully satisfied.

The Committee on Curriculum will present to the council, in its annual report, a model curriculum with such changes as it may from year to year deem expedient.

The Committee on Uniform Dental Legislation will make a study of the existing laws of the various states and present an annual report to the council on the possibilities of more uniform laws, especially in respect to dental education.

The organization is a most worthy one if the work is done conscientiously for the betterment of the profession, and from the representative men on the council committees we believe it will be.

The council desires the interest and support of the members of the dental profession and there seems to be no doubt but that it will be universally given if the council members take a stand for the higher educational requirements that are needed for the present and future demands of dentists, and that will be on a par with the requirements of the medical profession.

SOCIETY·ANNOUNCEMENTS

National Dental Association

PROGRAM.

Addresses of welcome by public officials and representatives of the Dental Societies and Local Committee. Response, Burton Lee Thorpe, St. Louis, Mo. President's address, Edward S. Gaylord, New Haven, Conn. "Evolution in Dentistry," S. G. Perry, New York City. At the General Session, Wednesday, R. H. Hofheinz, Rochester, N. Y., will be the essayist, but subject not received in time for this notice.

SECTION 1.

"Some Factors in the Growth of Modern Orthodontia," Frederick B. Noyes, Chicago, Ill.

"Physics and Dynamics Involved in Dental Casting," J. G. Lane, Philadelphia, Pa.

"The Question of Extraction in Orthodontia," C. S. Case, Chicago, Ill.

"Adapting Full Dentures," E. M. Kettig, Louisville, Ky.

"Crown and Bridge Work," Wm. O. Hulick, Cincinnati, O.

"Dental Impactions and Preventive Treatment," Varney E. Barnes, Cleveland, O.

SECTION 2.

"Mistakes, Common and Uncommon," C. N. Johnson, Chicago, Ill.

A review of paper by P. B. McCullough, "Wherein Clinical Evidence Is At Variance With Extension for Prevention," W. R. Clack, Mason City, Ia.

"What's in a Name," Frank W. Low, Buffalo, N. Y.

"Dental Societies and Their Purposes," Charles S. Butler, Buffalo, N. Y.

"The Necessity for Dental Education on the Subject of Mouth Antiseptics," Joseph Head, Philadelphia, Pa.

SECTION 3.

"Secondary Concretions of the Dental Pulp," W. R. Bunting, Ann Arbor, Mich. (a) "A Group of Deformities of the Nasal Respiratory Tract, Coincident With Dental Irregularities." (b) "A New Instrument for Comparative Measurements, Demonstrating Changes in Nasal Fossia, When Readjusting the Maxillary Arch," George H. Wright, Boston, Mass.

"The Necessity and Training of Prophylaxis Assistants," Alfred C. Fones, Bridgeport, Conn.

"Action on Tooth Structure of Various Colored Medicaments," W. H. O. McGehee, Cincinnati, Ohio.

(a) "Amalgam Experiments, Covering Their Manufacture, Manipulations and Physical Properties." (b) "Cements, Their Manipulation and Tests of Physical Properties," (Illustrated), G. M. McCauley, Abilene, Texas.

Wednesday evening will be devoted to a public Oral Hygiene meeting. "Oral Hygiene From an Educative Standpoint," Miss C. L. O'Neill, Cleveland, Ohio. "The Progress of the Work for the Past Year," J. P. Corley, Sewanee, Tenn. Another essayist will be selected later.

The Clinical Program is not complete at this date, June 8th; however, 277 clinicians have been secured and are classified as follows: American Circulating Dental

Clinic 40, Concerted Gold Filling 10, Surgical 10, Porcelain 26, Gold Fillings and Inlays 25, Orthodontia 13, Pyorrhea and Oral Prophylaxis 21, Crown and Bridge Work 45 and miscellaneous 87.

Membership in your state dental society, or allied societies, makes you eligible to the National; membership fee $5.00, which pays annual dues for one year and entitles you to copy of Transactions. Application blanks may be secured from the secretaries of the state societies, or from Charles W. Rodgers, Cor. Secy., 165 Harvard St., Dor., Boston, Mass.

The foregoing should prompt you to arrange to attend this meeting, which will be held in Cleveland, Ohio, July 25th to 28th, and become actively associated with our National organization.

Fraternally yours,
EDWARD S. GAYLORD, *President*,
63 Trumbull St., New Haven, Conn.
HOMER C. BROWN, *Rec. Sec'y.*,
185 E. State St., Columbus, Ohio.

CHICAGO DENTAL SOCIETY CELEBRATION

The Chicago Dental Society has planned for an enormous two days' celebration January 22nd and 23rd. This will be the 48th annual meeting of the society. We will have clinics on both days, and papers by the best men obtainable on both evenings.

This society has attained a membership of almost 1,200, and we propose to make this one of the greatest celebrations we have ever attempted. Program will be published later. Fred W. Gethro, Chairman Publicity Committee.

WEST VIRGINIA STATE DENTAL SOCIETY

The fifth annual meeting of the West Virginia State Dental Society will be held in Waldo Hotel, Clarksburg, W. Va., on Wednesday, Thursday and Friday, August 9, 10 and 11, 1911. Opening session at 2 o'clock, Wednesday, August 9. The Program Committee promises Papers, Discussions and Clinics of unusual interest. Mark off these dates now. Make your arrangements to be present for the entire meeting. Frank L. Wright, Secretary.

THE DENTAL EDUCATIONAL COUNCIL OF AMERICA

The second annual meeting of the Dental Educational Council of America will be held at the Colonial Hotel, Cleveland, Ohio, Monday, July 24th, at 5:00 p. m. An advisory conference will also be held in the evening of the same day at 7:30 o'clock, to which delegates from the following organizations are cordially invited: National Dental Association, State Dental Societies, Local City Dental Societies, Editors of American Dental Journals, State Boards of Dental Examiners, American Dental Colleges. Henry L. Banzhaf, Secretary.

INDIANA STATE DENTAL ASSOCIATION

The next annual meeting of the Indiana State Dental Association will be held at the Claypool Hotel, Indianapolis, Indiana, May 21, 22, 23, 1912. The Association has adopted as the slogan for this meeting, "1000 members in 1912." New and original plans have been perfected to make this meeting the "banner" meeting in our history. Otto U. King, Huntington, Ind.

THE DENTAL SUMMARY

The Magazine That Helps

Vol. XXXI AUGUST, 1911 No. 8

OFFICIAL ORGAN:

The Ohio State Dental Society	The Northern Ohio Dental Society
The Michigan State Dental Society	The Northern Indiana Dental Association
The Indiana State Dental Society	The Eastern Indiana Dental Society
The Kentucky State Dental Society	The Southwestern Michigan Dental Society
The Louisiana State Dental Society	Odontological Society of Western Pennsylvania
The West Virginia State Dental Society	The Lake Erie Dental Society

and Several Local Dental Societies

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L. P. BETHEL, M. D., D. D. S., Editor-in-Chief

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REGULAR CONTRIBUTIONS

THE ROENTGEN RAYS IN DENTISTRY *

By G. E. Pfahler, M. D., Philadelphia, Pa

THAT the Roentgen rays are useful in dentistry needs no argument before this Section, and that they should be more generally used I believe will be affirmed by all who have had experience with them. Most of the patients who are finally sent to the roentgenologist for examination have usually suffered months and even years with conditions that only needed a Roentgen examination to make the diagnosis clear and the line of treatment definite. As a matter of fact, most of the patients that come to me are those who have finally reached the consultant, who recognized the importance of an examination. Some of these patients had been tampered with for months or years by general practitioners of medicine or dentistry, and often teeth have been unnecessarily sacrificed. Surely the dentist with the greatest experience needs this exact method of diagnosis least; and yet, I repeat, nearly all my patients come from the consulting dental surgeon.

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*Read in the Section of Stomatology (A. M. A.), of which THE SUMMARY is the representative organ for the dental profession by special arrangement with the Jour. Amer. Med. Association.

There is scarcely a case in dentistry in which some definite information cannot be obtained, but it would be absurd to say that every patient should be examined with the Roentgen rays. It is, however, only fair to patients that every chronic or obscure case should have the benefit of this method of exact diagnosis. The skill of the modern dentist is simply marvelous and it is the most expert who welcome aid in diagnosis.

OBJECTIONS TO AN X-RAY EXAMINATION

Today there can be no real objection to an *x*-ray examination. It is clean, aseptic, painless, and absolutely without danger in the hands of an expert. The reason for discussing this subject is the morbid fear that has often been aroused in the minds of patients by stories published in lay journals. Most of these stories have been true, but the facts have been misinterpreted and misapplied. That the rays have done damage no one can deny, but practically all damaging results occurred in the early days of roentgenography or in the hands of incompetent men.

During the past nine years in which I have been specially interested in dental roentgenography I have never had a harmful result following one of these examinations. Today they are made with a few seconds' exposure, usually not over five, and never over thirty seconds. Any danger present today comes to the operator, who should do no work until he has learned to protect himself.

The fluoroscope has no place in dentistry. It is clumsy, inaccurate and dangerous to both the patient and operator. Lange[1] says:

> To the indiscriminate use of the fluoroscope many of the early errors in *x*-ray work can be directly traced. The image on the screen bears no comparison to the fine detail and distinctness which is obtained in the photographic plate or film.

A FEW HINTS IN TECHNIC

The rays should be confined to the area examined. They should be directed accurately to the point of greatest interest. This can be accomplished by means of the localizer which I described two years ago[2] before this Section. The same result can be fairly well accomplished when small cylinders are used. Secondary rays should be eliminated by means of diaphragms and cylinders.

When the disease or symptoms are confined to a few teeth or roots, and especially when affecting the upper jaw, the best results are obtained by placing a small film in the mouth. In this way the film is brought into almost direct contact with the teeth and the alveolar process, and the most

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1. Lange: Lancet-Clinic, May 16, 1908.
2. Pfahler, G. E.: The Roentgen Rays in Oral Surgery, THE JOURNAL A. M. A., 1908, l. 432.

beautiful detail is obtained. If, however, the bone, the accessory sinuses or large dental areas are to be studied, the roentgenograph is best obtained by the use of a plate placed outside of the mouth or face. Before this Section two years ago I described the technic by which every part of both the upper and the lower jaws could be clearly shown on the plate. Generally speaking, one should expect only two or three teeth clearly shown on either film or plate, and on this account the dentist should designate as nearly as possible the area to be examined.

The use of the plate is absolutely necessary in the study of the bone or the accessory sinuses, but it is also very desirable in searching for missing or unerupted teeth, in which instance a small film might not include the missing tooth and might thus lead to an error. Generally I use both film and plate and thus make one confirm or rectify the other.

The roentgenograph or *x*-ray picture is an accurate photographic record of the variations in density of the tissues traversed by the rays. The rays obey absolute physical laws, and when there is any error from their use it is due to the one who uses them or the one who interprets the plate, and not to the rays. The interpretation of the plate or film is much more difficult than the making of it. For the proper interpretation of the negative one should know the conditions under which the plate was made and the appearance of the normal tissues under such conditions; also, one should in a general way be familiar with the pathologic appearance of the tissues. I believe that the best results will be accomplished if the roentgenologist and the dentist confer on each difficult plate.

The degrees of density as measured by the rays are, in order, as follows: The greatest density is shown by metallic fillings, then by root fillings; next in density is the enamel, then the dentine, and finally the cancellous structure of the maxilla and alveolar process.

The value of a roentgenograph depends very much on a careful study of details, and therefore one of the first requisites is that it show rich detail. For observing the fine lines of the tooth structure and of the alveolar process the negative or film itself must be used, and this must be good. Much is lost in any reproduction.

THE STUDY OF THE NEGATIVE

Next in importance for reading a roentgenograph is a careful lighting of the film or negative. A uniform white light is necessary. This white light can best be obtained by means of an illumination box, or by light reflected from a sheet of white paper, or by light reflected from the northern sky. The film or negative should be surrounded by a black surface so that the eye can be concentrated on the small point of study. If attention be given to these points, almost every one can appreciate the value of the examination. Very often good negatives are condemned by untrained men, because they see little or nothing when they hold the negatives before a gas or electric lamp. This gives a yellow light and the beautiful detail is thus lost.

If studied by correct methods, the ordinary film should show that the root is smooth in contour, although it may be variously curved, and that the cancellated alveolus hugs the tooth closely. The root canal can usually be easily recognized and is smooth in outline. The dentine is normally uniform in density. The alveolar process is uniformly mottled and shows the beautiful cancellous network.

ROOTS, ROOT-ABSCESSES, EXOSTOSES AND PULP STONES

Now, what are the pathologic appearances and conditions that may be observed? Points of decay or abscess within the root itself show an interrupting disturbance in the dentine indicated by a light area.

Incomplete filling of the root canal may be shown. A pericementitis is shown by a light space between the root surface and the alveolus, and the root surface is roughened. Abscesses about the tip of the root or in the alveolus are likewise recognized by light areas in which no cancellous structure can be made out.

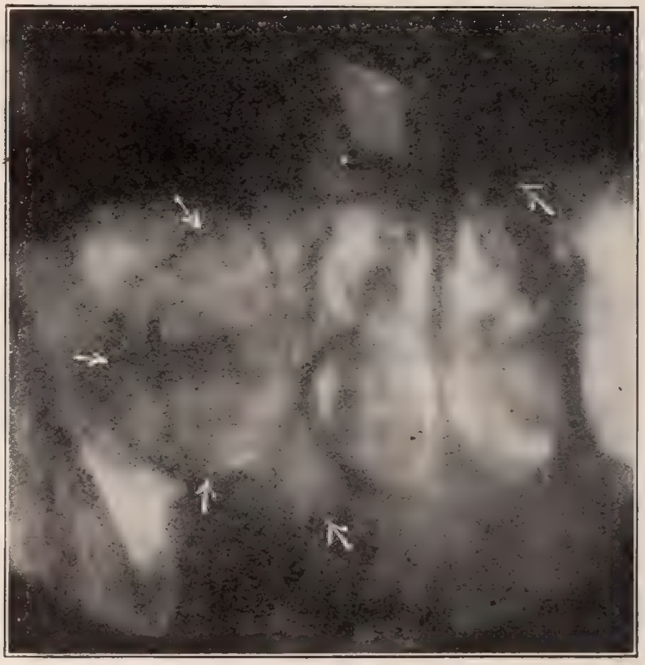

Fig. 1.—Pus in right antrum. See clear left antrum. Case of Drs. Gleason and Starr.

Many of the cases coming before the dentist present symptoms of obscure origin; sometimes sinuses exist whose source is a riddle, and these may persist for a long time. Probing seems to be attended with some danger of spreading the infection to healthy tissues. Sometimes these abscesses follow dental work, either crowning or filling. At other times inflammation may exist simultaneously with the dental work, but in no way connected with it. The dentist will feel much relieved when it can be clearly demonstrated that his work is not responsible for the inflammation and pain.

Schamberg says "It has become an invariable rule with me to take a radiograph of every chronic abscess before performing any operation, and occasionally I take a second or third radiograph to note the progress of the case."

When men like Cryer, whose wide experience and skill in the use of the probe is recognized by all, make constant use of the rays as a diagnostic agent, its superiority over other methods cannot be questioned.

The roentgenograph will make plain whether the root or only the alveolar process is involved, and consequently help to decide whether the abscess should be drained through the pulp canal or through the alveolus, and if through the alveolus whether a simple curettage would suffice or whether apical excision be necessary to eradicate the infection. Furthermore, the roentgenograph should show how much of the root should be removed. Dray says:

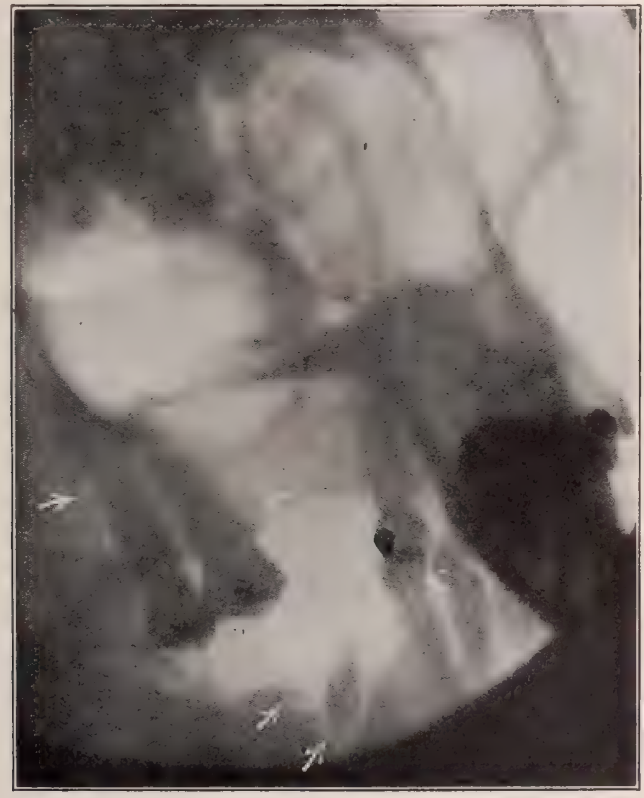

Fig. 2.—Shows cause of pus in Figure 1. Abscess about root, with pericementitis.

> Much untold suffering could be avoided, many guilty blunders obviated, many blessings bestowed on the dentist by the use, in the hands of the expert, of the x-rays. The dentist who fails to use this wonderful adjunct of modern dental diagnosis and therapeutic agency must go through life with a blunt or troubled conscience.

Lange asks:

Would it be ultrascientific to suggest the aid of the skiagraph in all operations on the root canal? In the various manipulations on the root canal the dental surgeon is working more or less in the dark. In cleaning out such a root canal, owing to varying shapes and lengths of roots, it may be impossible to determine whether or not the apex of the root has been reached. By inserting a fine broach into the canal and skiagraphing the tooth with the broach in position this point may be cleared up. In drilling out a root canal for the insertion of a pin or post for anchorage, this same procedure will tell whether you are drilling in the right direction and whether deep enough or not.

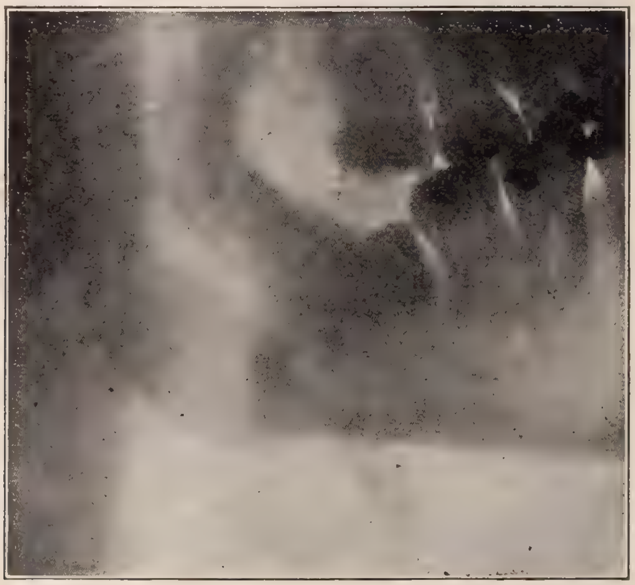

Fig. 3.—Impacted third molar. Dr. Dray's case.

In several cases in which the roots were curved, I have found that the drilling extended through the side of the tooth and into the alveolar process instead of to the tip of the root canal.

Exostoses of the roots seem to be rather frequent. They cause much suffering and often explain failures in removing roots in the process of extraction.

Whorls (dense areas of bone) have been found by Cryer to explain some of the obscure cases of neuralgia.

Pulp stones, by no means rare, cause much suffering and may be demonstrated in the roentgenographs as shown in one of my slides.

UNERUPTED, IMPACTED, SUPERNUMERARY, AND ENTIRE ABSENCE OF TEETH

One of the most important uses of the rays is the detection of unerupted, impacted, supernumerary teeth and the absence of those that should normally exist. The development and eruption of the teeth can be followed from the very beginning, and if the rays are used early the orthodontist can surely correct more easily the deformities that occur. If one follows the development of a tooth from its very incipiency, one first detects the formation of the enamel cusps, then the crown; later the root of the complete tooth with its pulp canals.

Unerupted teeth sometimes assume such freakish positions that it seems unwise to wait and guess, when we have at hand a painless and accurate means of diagnosis. Much suffering and annoyance may thus be avoided.

Impacted teeth are rather common; the trouble affects especially the third molar, though any of the teeth may be affected. The tooth may even be inverted and be growing in the opposite direction to the normal position. These impactions usually cause great suffering and often the destruction of adjoining teeth, leading to abscess formation with surrounding inflammations, etc., which interfere with mastication and deglutition and lead to serious conditions. These impactions are often the cause of obstinate and persistent neuralgias.

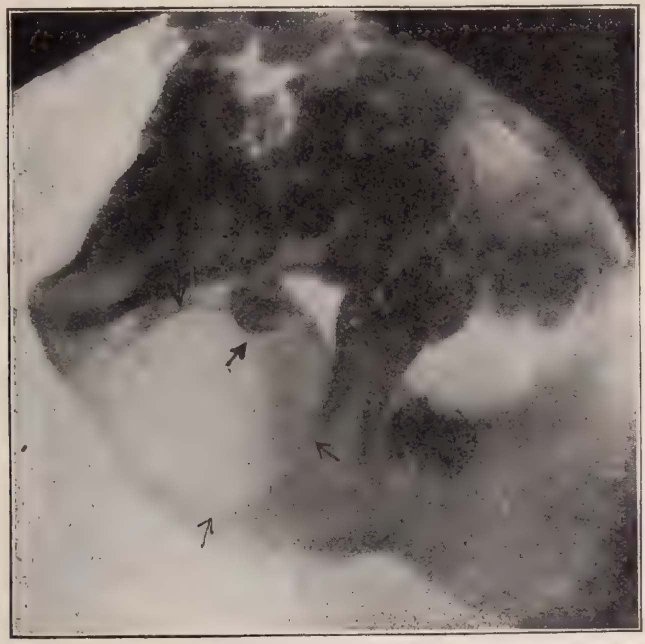

Fig. 4.—Bone cyst. See inversion of erupting teeth. Dr. Schamberg's case.

All orthodontists agree that the deciduous teeth are often sacrificed too early, leading to undevelopment or later deformities of the jaws. On the other hand, a deciduous tooth often interferes with the eruption of the permanent, and causes much unnecessary suffering. What other accurate guide have we in the control and observation of erupting teeth?

THE MAXILLA AND THE ACCESSORY SINUSES

The affections of the maxilla and the accessory sinuses are generally brought to the attention of the general medical or dental practitioner. If he fails to realize the possibility of disease in these areas and fails to use the roentgenograph as an aid in diagnosis, much valuable time will be lost and much unnecessary suffering will result.

In the lower jaw we must consider especially fractures, necrosis, tumor formation, and cystic degeneration. The location of a fracture is indicated by a transparent line, usually jagged in outline. Its union is indicated by the gradual disappearance of this line and by the formation of callus. Non-union is indicated by the persistence of and widening of this line and by the formation of sinuses, and often by the formation of excessive but unhealthy callus. The roentgenograph will thus aid materially in deciding on the line of treatment and especially determining whether the interdental splint should be used, or whether the case calls for the wiring procedure. If wiring be decided on the roentgenograph will indicate the best points for the drill holes. Not infrequently these fractures will be found to have been preceded by abscess formation at that location. The knowledge of the presence of an abscess will surely be important in deciding the line of treatment.

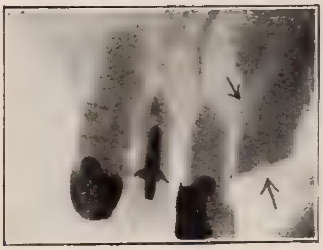

Fig. 5.—Curved incisor, showing hole drilled through the side of the tooth. Dr. Ickes' case.

Necrosis is indicated by a disturbance in the fine network of the cancellous structure of the bone, usually consisting in increased transparency due to destruction of the bony elements.

Tumors of the lower maxilla are shown by a destructive disturbance in the cancellous structure of the bone, but it is less definitely outlined than in necrosis and abscess formation, fading more gradually into the healthy bone, and is often associated with the formation of new tissue. Carcinoma seems to cause more destruction of bone and less formation of new tissue than sarcoma. Most of the tumors seem to be sarcomata and the rays will assist in determining whether only the periosteum or the bone itself is involved. The extent of the disease can also be determined and thus material assistance can be secured in outlining the treatment.

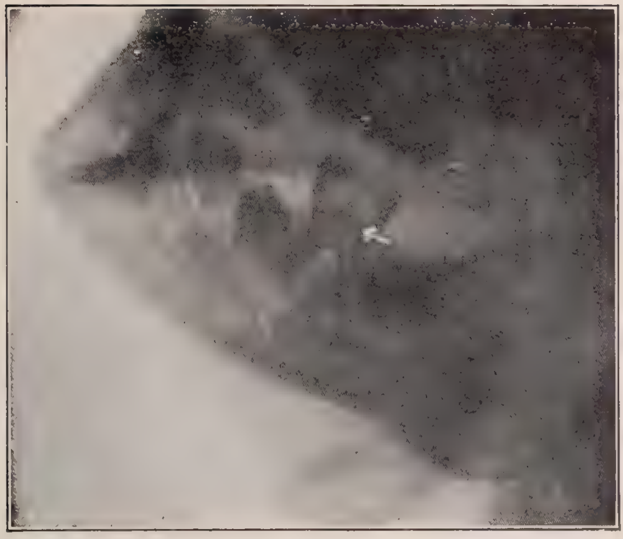

Fig. 6.—Showing pulp stone in crown, and abscesses at the root. Dr. Schamberg's case.

Cystic degeneration in the bone is comparatively rare, but it should be borne in mind in obscure cases and it can only be accurately diagnosed by means of the rays.

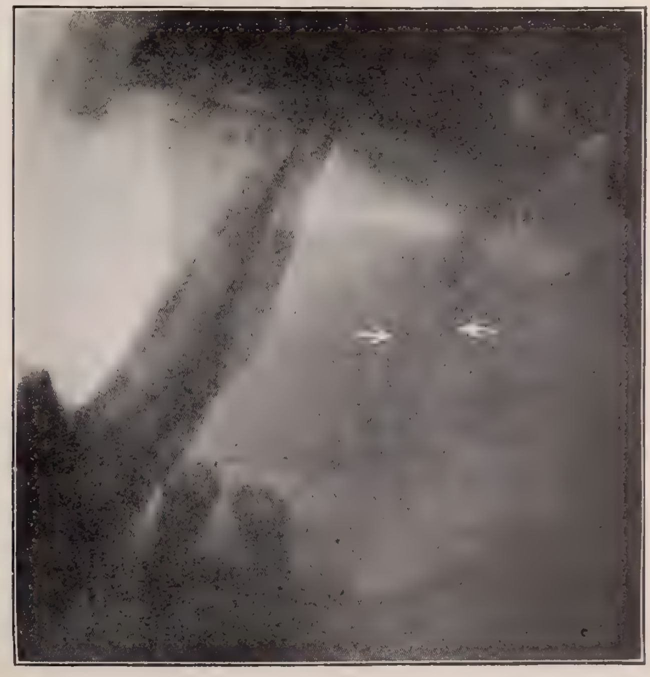

Fig. 7.—Fracture of styloid process due to pressure by dentist back of the angle of the jaw. Dr. Laplace's case.

If the upper jaw is involved by necrosis or the formation of a tumor, its demonstration is more difficult than the same in the lower mandible. Affections of the antrum as well as of the other accessory sinuses leading to the accumulation of pus or tumor formation can be nicely demonstrated and often the cause can be shown by the use of the *x*-ray. It is well to know whether the pus in the antrum is due to a decayed tooth or not. The *x*-ray will also show at what point the antrum should be drained; the most dependent portion of the antrum can be determined and the best drainage obtained.

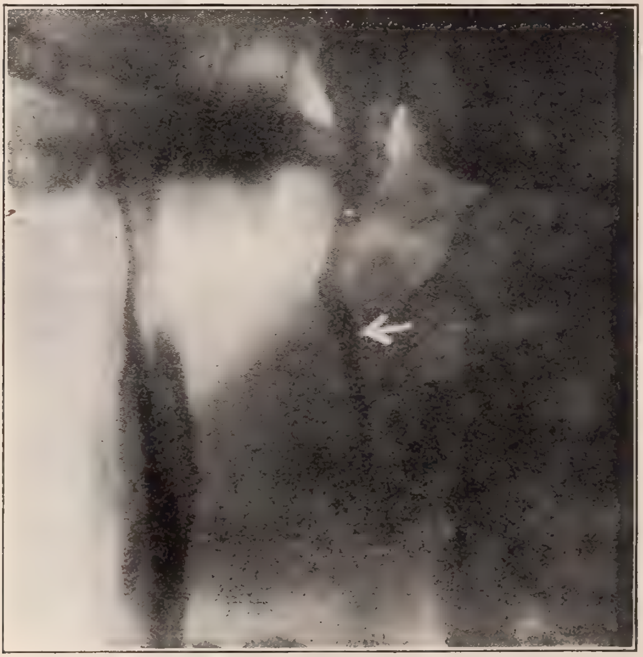

Fig. 8.—Same case as Fig. 7. Healthy side. Shows abnormally long styloid process.

THERAPEUTIC APPLICATION OF THE RAYS

The application of the rays therapeutically has been less extensive, though there have been sufficient scattered reports of good results to justify its consideration in obstinate cases and when other methods have failed. I have myself seen marvelous results in the treatment of sarcoma of the bones and sinuses of the face. I have seen pyorrhea of the antrum that resisted all other forms of treatment, including repeated curettement, get well under the influence of the rays. Obstinate cases of idiopathic neuralgia will sometimes yield quickly. I have seen good results in old and obstinate cases of pyorrhea alveolaris. Dr. Weston A. Price, of Cleveland, has made the best reports[3] on this subject.

[3] Cleveland Dental Society, Jan. 4, 1904.

CONCLUSIONS

1. There should be a more general use of this valuable diagnostic and therapeutic agent in dentistry.
2. It is without danger in the hands of an expert.
3. It is a painless, aseptic and accurate means of diagnosis.
4. All parts of the jaws can be shown on the plate. The finest details of the tooth structure and alveolar process can be best obtained by using a film within the mouth.
5. This method of diagnosis should be used in obscure cases, especially in chronic abscesses, the examination of roots and pulp canal fillings, etc., of offending teeth with persistent non-yielding pathologic conditions.
6. The rays are particularly useful in diagnosing unerupted and impacted teeth, root abscesses and alveolar abscesses, exostoses, tumors and necrosis and, last but not least, pulp stones.

Finally, I desire to express my appreciation of the courtesy of Drs. Cryer, Dray, Schamberg, Cameron, Warren, Faught, Mershon, Babcock, Cupid, Bernds and Gray and others in referring these cases.

POPULAR DENTAL EDUCATION AND PUBLIC SCHOOL INSPECTION*

By W. H. Shaffer, D. D. S., North Manchester, Indiana

POPULAR dental education and public school inspection has been the subject of many papers and much discussion by numerous ardent and sincere workers during the past twenty years. The accomplishments, the advancement and the progress which the pioneers in this movement have made is most gratifying. Yet, on the whole, the result of the vast amount of labor and effort in this direction has, to a great extent, been a disappointment.

Viewing the situation in a general way it appears that the lack of a concentrated, definite, tangible, united action has been largely responsible for the slow and indifferent progress that has been made. That there should be a variety of plans and opinions as to just how the ultimate result can be best obtained is but natural. In truth, it seems evident that a plan that is effective and efficient in one locality would be ineffective and inefficient in another. For instance, in centers of population—in large cities—where the School Boards have a close organization and keep in intimate touch with the different departments of the public school system; where the general public has become accustomed and acquainted with the benefits and blessings of hospitals and public clinics; where these institutions are conveniently located and easy of access; where strong local dental society organizations exist it would seem that the marshalling of these conditions under the flag of humanity and philanthropy for the achievement of the desired result would be an easy task indeed. Yet in these favorable localities after years and years of labor and effort the arousal of a healthy and responsive public interest has been next to impossible.

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*Read before the Indiana State Dental Society, 1910.

Take New York, for instance, with all these favorable local conditions —it was only after years of struggle and agitation that anything like a satisfactory progress was obtained. Again, in Cleveland the movement met with little or no encouragement—was practically abandoned then taken up again only to meet with discouragement from almost every source. The local Dental Society, the Board of Health, the Medical Fraternity, the Board of Education all exhibited an utter lack of concern. But a few brave and dauntless men continued the struggle until finally the sympathy and co-operation of Superintendent Jones of the public schools was obtained and they now have a system of inspection and hygienic work that is in every way worthy of emulation. Quite recently the first free dental dispensary for school children was opened and began its career of good in Chicago under the auspices of the United Charities in co-operation with the Englewood Dental Society. Other gratifying results have crowned the prolonged labor of the determined men who have advocated the cause in that city. The history of the efforts in these cities is a typical illustration of the experiences in other cities where a determined attempt to inaugurate public school inspection has been made.

In some of the continental countries of Europe a most desirable system of inspection and public dental clinics obtain. But their method of making laws in most of the countries is so much different than ours—their subjects are accustomed to being compelled to follow the dictates of the government so that when an official proclamation is made along domestic lines they bow in meek submission and never dream of becoming insurgents.

But how about Indiana—has she been a leader of the cause—at the head of the column in this, the greatest crusade for mankind ever inaugurated by the dental profession? Much is expected from Indiana and it is right that much should be expected from her. The center of population, "in the very heart of the republic." The home of authors and of educators, of humorists and of novelists, of scientists and of philanthropists, of statesmen and of diplomats. She gave this nation the bravest generals and the most gallant soldiers of modern times. She furnished this republic one of its grandest, purest, ablest and most high-minded presidents, and she is just on the verge of furnishing another. In view of Indiana's glorious past in every department of human endeavor it is but fair to expect the dental profession of the state to lead the way in this great cause of humanity. After all, the overwhelming question is what can we do for mankind? Our highest aim and noblest impulse as dentists should be to triumph over disease for the welfare of the human race. To secure complete victory over disease is, of course, beyond the range of mortal possibility, but our inspiration should guide our footsteps toward the development of a perfect physical manhood.

The direct appeal of the dentist to the patient and parent has laid the foundation for this work and will continue to be the mainstay in whatever plan that may ultimately be adopted. Too much credit cannot be given the individual dentist for his earnest endeavor. Yet the vast amount of labor necessary when a direct appeal is made, together with the fact that there is yet a large per cent. of the profession that is slow to respond, and the fact that the very persons most needing aid and advice rarely come under the care of the dentist at the right age, makes a more general plan imperative.

It has been urged that the individual practitioner in the different localities give talks and lectures before the pupils and teachers of the public schools. That very little can be accomplished at the present stage of development is almost self-evident. The lack of sympathy on the part of the school officials—to say nothing of the teachers themselves—together with the want of united action on the part of the dentists in the different localities; the fear of being charged with sinister motives—and again many localities are without a dentist who is fitted by nature, inclination and acquirement to take up the burden of labor in this manner—makes the efficiency of this plan most doubtful.

The mighty agency for molding public opinion, thought and action is the press. Whenever this militant and agressive power advocates our cause the battle is more than half won. Quite recently one of the greatest newspaper syndicates in all the world, with a circulation of more than 3,000,000, in several different issues gave an illustrated supplement dealing with the care of children's teeth, the need of school inspection and the establishment of public clinics. The value of these articles is almost inestimable. Yet the press generally received them indifferently, some even with open hostility. Soon after the publication of these articles an editorial appeared in one of the leading Indianapolis dailies openly and viciously attacking the propaganda and denouncing it as useless and harmful—declaring that soon every trade, craft, ism and specialist would insist on forcing some department of his vocation into the public school curriculum of the state, pointing out that already the schools are teeming with many useless fads and fancies. The trouble with that fellow is not that he has been "seeing things," but that he has not seen the wonderful and marvelous accomplishment of orthodontia and kindred departments of dental surgery,—if he ever does his "fads and fancies" will vanish as peacefully as a mist before a summer's sun.

The dental journals have been earnest and powerful advocates and as a goodly number of dentists themselves are not yet alive to the supreme practical and humane possibilities of this movement the journals should continue their crusade. One of the leading journals, however, has become considerably exercised over a "tendency," as it says "to commercialize the fundamental spirit of philanthropy which should be the sole and sufficient motive back of the work. If the manufacturer of," it declares, "or dealer in dental supplies is to be annexed to this movement—even to the extent of promoting it under the spacious guise of conducting an educational campaign in favor of dental public service, but really with the object of creating a larger market for his goods—it will not only result in failure to attain the object, but will strike a fatal blow at dental professional life from which it cannot recover.'' Yet this same dental journal is published by a manufacturer of dental supplies and there is a faint suspicion that whatever filthy lucre this same writer receives for his spirit of philanthrophy and professional labor is received from the same sordid dental manufacturer.

I don't know how it is in Philadelphia, but this much I do know, that many society meetings in Indiana in years past would have been in a sorry plight had it not been for the financial aid and assistance of the dental trade. Not only in a financial way has the dental trade contributed to the success of many meetings, but also with its exhibits and demonstrations of new appliances and equipments which represented the practical advanced thought of the profession. Such demonstrations, for instance, as were given years ago when crown and bridge work was coming into vogue—later in porcelain inlay work—then in the casting machines and so on. In truth, many meetings, when a new achievement in mechanical dental progress was being brought before the profession, the dental trade was not merely a side show but was the overwhelming and extraordinary attraction under the main canvas. No profession, no trade, no department of human activity that employs delicate instruments and appliances has a more responsive ally than has the dental profession in the manufacturer of dental supplies. So when the dental trade with its splendid organization, with its trained and experienced men, enters this work, it will add a great chapter to its record.

Again, another dental journal has discovered a mare's nest and has worked itself up to an intense state of excitement. It is resting under the hallucination that all this agitation for public school inspection is inspired by specialists who expect to reap a rich reward in their special department. This myth is so narrow-minded and childish that it isn't worth a reply. In less than ten years these same writers will be denouncing their own child and will loudly proclaim themselves as the original Moses.

Happily, there are very few discordant notes among the dental journals and they are to be congratulated and applauded for their high-minded, aggressive and powerful campaign in promoting general education in oral hygiene.

The circulation of pamphlets on the care of the teeth—articles by dentists in local papers and ''57 varieties'' of other schemes have been launched, all with more or less merit. Those which honorably and consistently advance the cause should be welcomed and encouraged.

And now the grave question is how can we bring about a victorious campaign for popular dental education and public school inspection in Indiana?

Anything like a general state-wide movement presents many difficulties and a most stupendous undertaking. Having but few cities of any size—with most of the population scattered over a wide territory—makes the general public difficult to reach with an educational movement of this character. It appears that the public school teacher and the family physician would be the most available channel through which the desired portion of our population can be reached. As all children come under the care of the teacher and the physician at some time, the value of their influence is beyond computation. Whenever we can satisfy the teacher and the physician of the merits of our cause they will give it their active support and the powerful influence which it deserves. How can the sympathy and co-operation of the teacher and physician be enlisted in the cause? The attendance at the state, county, city or township institutes on the part of the teacher is well near compulsory. So it is through this medium that the teacher can be quickly and certainly reached. A series of talks and lectures, supplemented by stereopticon views, before these different institutes would bring the matter forcibly and effectually before the teacher. These views should encompass the range of facial and oral deformities, vividly portraying to the fullest extent possible the baneful and hideous aspect and effect of malformations of this portion of the human anatomy. They should further show the result, the accomplishments as brought about by the scientific and skillful treatment of the dentist. These views will effectually and indelibly impress themselves on the mind of the teacher. Of course, all these are familiar to the dentist, but strange and unknown to the teacher.

So the value of these illustrations cannot be overestimated. For verily, in this case, at least, an ounce of sight is worth a ton of hearing. "Seeing is believing." Scientists estimate that 82% of all knowledge gained is gained through the sense of sight. The first picture ever drawn was drawn by God Almighty Himself when He threw the rainbow in the heavens, and from that day to this the sense of sight has been the supreme gateway to human understanding.

The physician can be reached in a similar way as the teacher—through his state and local societies. Some may wonder if it is the fault of the dentist that the average physician is not alive to the humane possibilities of this movement and whether it is the duty of the dentist to go to the physician and attempt to excite his professional and personal interest in a subject of this character? Yes and no. You may answer that question to suit yourself. But this much is true—we need and must have the help of the physician. He is made powerful by his relation to the family. His practice fastens him to the people. His official positions on Boards of Health and the like all render his influence a necessary factor for success. And as he is slow to come to us it is our duty to go to him. If the mountain will not come to Mahomet—then Mahomet must go to the mountain. An investigation would reveal the fact that the average physician is not aware of the possibilities in the treatment of oral deformities. For instance, at the meeting of the Northern Indiana Dental Association at Goshen last year, a series of stereopticon views, supplemented by a lecture, was given on this subject, showing a large range of facial deformities and also showing the result of skillful treatment. The discussion was opened by a physician—a rhinologist of considerable reputation—who expressed his astonishment at what he termed "the truly marvelous result of modern dentistry," and reproached the dental profession for not making the medical profession acquainted with these possibilities. Other physicians who were in attendance reiterated the same statement and expressed the same sentiment. The writer was made to wonder if this lack of information was common in the medical fraternity. A personal investigation was started and in talks with many physicians it was found that the lack of knowledge on this subject was startling and that little or no interest was taken in it. But as soon as some illustrations were shown along the line here suggested, immediately a wonderful interest was excited.

And so whenever these two powerful agencies—the teacher and physician—are enlisted in this crusade, victory will be ours and the complete fruits of that victory can be worked out as conditions and circumstances present themselves.

With enthusiasm, faith, hope and work this great cause of humanity will triumph for the betterment of mankind to the honor and to the glorification of dentistry.

DISCUSSION

Dr. C. C. Miller, Plainfield, Ind.: I am glad to have the privilege of discussing this paper of Dr. Shaffer's. The subject is one in which I have been especially interested for years.

The essayist has handled his subject in a very able and thorough-going manner, and there is no part of it with which I wish to disagree.

To me the "hand writing on the wall" points to better things in the way of popular dental education. And I believe that the liberal attitude of the individual members of our profession, together with the broad view taken by our dental journalists, is responsible for this rapidly changing condition.

The spirit of jealousy and envy has been too prevalent among us. We have been too fearful that some particular member of the profession might reap a personal reward by his philanthropic work.

It matters not how the public is educated so it is done honestly, and just as we do educate this public to an appreciation of high grade dental service, just so will the profession be called upon to deliver the higher gradations of professional skill. The only way to insure the public of the best there is in the profession is to place it in a position to discriminate; and it makes but little difference how this campaign of education is brought about, so it is done.

The word "advertise" has been a great stumbling block to many of the members of our profession; and it is for this reason that we have allowed a wall to be built up around us and have called this wall "dental ethics."

The profession has outgrown the limitations of the printed code of ethics, and the wall is being torn down. I am glad to know that we are entering upon a new, a broader and a grander field of activity, and I have no fear that this natural evolution will lower the standards of dentistry by commercializing the profession which is so dear to us.

Dr. J. W. Roper, Princeton, Ind.: We are to be congratulated upon having such an important paper as Dr. Shaffer has given us, as his subject is one that is attracting more attention than anything else has done heretofore, and I dare say that few of us thus far realize what an important subject it is. I agree with Dr. Shaffer in the great amount of work that has been done without accomplishing but very little, and the disappointment to the ones pushing this noble work can be much appreciated by myself, as I have been through it, and am talking from personal experience.

What is the cause of all these disappointments? I find that most of the dentists need to be educated along these lines, and that most of them are waiting for someone else to take the lead, so if there is any criticism made, the other fellow will receive it. I feel if our dental colleges throughout the country would pay more attention to *educating the students* of the importance of *educating the public,* the work of dental inspection would be accomplished without so many disappointments. Of course, we have no law compelling dental inspection, but there is one thing sure, if we will give our assistance to the legislative committee we can have one that will be a credit to Indiana.

How about Indiana? I am proud to say that she is among the first in the Central States to start dental inspection and education in the public schools. If you could see the amount of good we have done in our schools at Princeton and Oakland City, every one of you would be willing to stand some criticism and take up the work in your home towns, for it is a life-saving movement and every one of us ought to lend a helping hand toward the movement of educating the children in our public schools.

I feel it is the duty of every dentist in Indiana to give talks and lectures to the teachers and pupils, as the time is here when the children want to know more about their teeth and the care of same—and whose duty is it if not ours?—for we know more about the teeth than the teachers do, and by educating them we will soon have it distilled into them so it will become a habit to care for their teeth, as habits formed during childhood, whether good or bad, will remain with them throughout life.

I feel the newspaper is one of the best mediums for educating the public, as every person, both rich and poor, reads the papers, and we should all assist our local editors and see that the proper kind of material is furnished for publication.

The editor of one of the leading papers in Indianapolis, making an attack on the movement of dental education and inspection in our public schools, is to be pitied rather than censured, for it was lack of education that caused him to make the attack. Such men ought to be educated concerning the importance of caring for the teeth, and they will feel better and can do a great good for the cause in the community in which they live.

As to the work the dental journals are doing, it is wonderful and should be given our support. I am proud that we will soon have a magazine devoted to Oral Hygiene and Dental Education alone, and it should be read by all in our profession as we all need to be educated more about oral hygiene.

The question of a state-wide movement on dental education in our public schools is indeed a very large one, but can be accomplished very easily if all the "dentists" throughout the state will become "Is Now" rather than "Has Been," and become more ethical toward one another, rather than a lot of petty, jealous babies. It is really a shame to see how narrow minded some of the dentists are. The thing to do is throw your hammer in the well, get together as brothers should and do something. Educate the teachers of our public schools, and also the physicians, as it is surprising how little most of the physicians know about the mouth and teeth. Then for us to sit around and let them make laws regulating dental inspection in our schools, when we take a three years' course on the teeth and mouth alone and they only take a four years' course on the entire body, is preposterous. I will admit that physicians and dentists should go hand in hand in this movement, and if we all put our shoulder to the wheel and push, the task will not be hard on any one.

Dr. S. W. Shields, Bloomington, Ind.: After having given the subject just presented years of study, I can heartily endorse all that is contained in the very able paper just read by Dr. Wm. H. Shaffer. While I do not care to take your time in discussing the paper, I would like, in a few brief moments, to tell the brother dentists the part I have taken in the line of dental education. I drafted a bill on dental education and had it introduced by Senator Wood in the legislature of 1905. It was referred to the committee on health; the committee saw fit to recommend it—adversely. So I let the matter drop so far as any further attempt to have it favorably reported, as I thought I could see that the bill was in advance of education in this line, and until the subject was fully understood it was useless to force the measure.

I here present a copy of the bill:

SENATE BILL NO. 109.

An Act creating the State Board of Dental Instructors, providing for their appointment, election, qualifications, compensation and duties, and providing for certain instructions in the Common Schools by local Dental Instructors and other matters properly connected therewith.

Section 1.—Be it enacted by the General Assembly of the State of Indiana, that there be, and there is hereby created, a State Board of Dental Instructors to be composed of three members, each of whom shall be a qualified dentist of the State of Indiana, to be appointed by the Governor of the State of Indiana, who shall hold their offices for a period of two years from such appointment, provided that the Governor shall within thirty days after the taking effect of this Act make such appointments and every two years thereafter, and the Governor shall at all times promptly fill all vacancies that may occur on said Board by death, resignation or otherwise.

Section 2.—It shall be the duty of said Board of Dental Instructors to meet at the City of Indianapolis, Indiana, in the month of July of each year, and organize by electing one of their number as President, one as Treasurer and one as Secretary.

Section 3.—At the same time and place the said Board of Dental Instructors shall prepare a course of instructions on the care of the human mouth and teeth, and shall arrange such course of instructions in ten sections.

Section 4.—The State Board of Dental Instructors shall have printed in pamphlet form a sufficient number of copies of said course of instructions (not to exceed one thousand) and a sufficient number of certificates each year, to be used by the local Dental Instructors in the various schools that may be assigned them.

Section 5.—It shall be the duty of each Township Trustee or School Board of incorporated Towns and Cities to employ, each year, prior to the opening of the schools, competent Dentists (local Dentists being given preference) for the various schools, and any Dentist receiving such appointment and failing to comply with the provisions of this Act may be discharged and another Dentist appointed to fill out his term.

Section 6.—Each Dentist receiving appointment as Local Instructor shall procure from the State Board of Dental Instructors one copy of the course of instructions prepared by the State Board of Dental Instructors, and shall pay to the State Board of Dental Instructors One Dollar for said copy.

Section 7.—It shall be the duty of each Dentist receiving an appointment as Local Dental Instructor to visit each school once each month of the school term and instruct the pupils of said school or schools according to the instructions outlined by the State Board of Dental Instructors and shall limit such instruction to one hour.

Section 8.—At the conclusion of such instruction the Instructor shall present to the teacher of said school a certificate stating that the said Instructor has complied with the provisions of this Act, and the teacher shall sign the certificate, giving date and hour of instruction.

Section 9.—Upon the presentation of such certificate, properly signed, to the Trustee or to the Treasurer of the School Board of incorporated Towns and Cities, the said Township Trustee or Treasurer of School Boards shall pay to the Instructor the sum of $2.50 for each certificate, said amounts to be charged to the Common School Fund.

Section 10.—The State Board of Dental Instructors shall make an annual report to the Governor of said State, stating fully the work of the State Board of Dental Instructors, and also the work of the Local Dental Instructors, noting therein the improved healthful condition accomplished by the adoption of the instructions to the pupils of the various schools.

Section 11.—The State Board of Dental Instructors shall receive no compensation for their services, except as provided for in Section 6 of this Act.

Section 12.—WHEREAS, an Emergency exists for the immediate taking effect of this Act, the same shall be in force from and after its passage.

THE PATIENT'S PART IN MAINTAINING ORAL HYGIENE*

By Charles S. Tuller, D. D. S., New Orleans, La.

IT is perfectly evident that no reasonable amount of effort on the dentist's part, alone, can accomplish the desired results in the maintaining of hygienic oral conditions. We must have the full co-operation of our patients or else most of our effort is wasted. It is quite a problem to know how to secure this co-operation, but as each operator has his own personal method of persuasion, I will only state that for myself it has been most readily secured by appealing to the pride of the patients and inoculating them with the virus of disgust against oral filth.

Assuming that we have aroused the patient's interest and pride, what instructions are we to give them? As a profession we should be a unit as regards method and as we are become instructors of the public, the following suggestions are offered as a basis for this work.

ARTICLES NEEDED AND REASONS FOR USING THEM

In the first place comes the tooth brush as the most important article of the human toilet. This *must* possess most of the following characteristics: A *small* brush on a long handle, with a slim neck, extending from the bristles about two inches along the handle. The *small* brush, that it may be easily used in any part of the mouth, the slim neck to avoid interference from lips and cheek, and the long handle to reach behind the third molars. The bristles should *always* be as stiff as the gums of the patient will allow, always purchasing a stiffer bristled brush at each purchase, as the gums become hardened to them. The bristles should be in tufts of unequal lengths, as the surface to be brushed is very uneven and the bristles must be able to reach into all the crevices and embrasures. A brush with bristles all of the same length would do to brush a plane, flat surface, but could never brush *efficiently*, so uneven a surface as is presented by a row of teeth. Each tuft of bristles should be set far enough from one another to allow plenty of space to take advantage of the flexibility of the bristles, thus allowing them to spread and so adapt themselves to the uneven surface. Stiff bristles can soon be tolerated in the most tender mouth and should always be used where the brushing is done according to directions to follow. A soft bristled brush positively cannot begin to keep the teeth clean or the gums healthy. The soft pasty character of most of our present

*Read before the Louisiana State Dental Society, 1910.

day food makes it stick to the teeth and fails to give the gum its necessary and proper massage. This last can only be replaced by the vigorous use of a stiff bristled brush, which incidentally sweeps the teeth perfectly clean.

Dental floss is an indispensable assistant in removing debris from between the teeth and massaging tooth necks and gum. A *heavier grade* than that used at the chair is more efficient, such as Cutter's Ribbon Floss "R." Certainly if we can break up and keep in commotion colonies of bacteria that inhabit the interproximal space they will get little chance to damage the enamel and cause caries there. In a like manner it will help prevent the formation of calculus between the teeth.

A tongue scraper is also an important toilet article and (the contrary opinion of some of my contemporaries notwithstanding) it *does* remove literally millions of bacteria when drawn over a tongue that is apparently clean. As the tongues of the majority of people are always more or less coated the quantity of bacteria removed must be enormous and certainly the mouth and entire body is well rid of any, though even a small quantity of these mischief makers.

Tooth powder should contain no grit, the most perfect base being precipitated chalk, *not* prepared chalk. Real precipitated chalk is a difficult article to secure at the average drug store. However, the S. S. White Dental Mfg. Co. furnishes a splendid article at small cost. Right here it may as well be stated that a perfectly cleanly and polished condition of the teeth *cannot* be maintained without the use of an abrasive powder, and precipitated chalk fills the need perfectly. That a powder is necessary has been many times proven in my own mouth and in the mouths of many of my patients, as well as in the practice of my best known *confreres.* Tooth pastes and liquid dentifrices for use on the brush are to be condemned on general principles, as most of them are inefficient cleansers and many are really injurious.

The use of both hands, alternately, in cleansing the teeth is to be recommended. A one-sided job usually results where one hand alone is used, both because it is impossible to get all the proper motions with one hand, and where brushing is done with sufficient vigor, the arm, wrist and hand become too tired to do good work. Also there are usually places in the mouth, notably in the cuspid region, where the brushing is overdone and harm to tooth and gum results, where one-handed brushing is done. Where each hand is used alternately they do not tire, an even brushing all round is obtained and all the necessary motions are produced to do a thorough job. The difficulty of using the left hand is soon overcome with a little practice.

The mouth wash should of course be prescribed to meet the needs of the case, such as one highly or slightly germicidal or highly or slightly astringent or highly or slightly alkaline, etc. The one meeting the greatest range of applicability is probably one of the new Milks of Magnesia in combination with the active germicides usually used in mouth washes. This mixture is not only very pleasant but very effective as an anti-acid and germicide. Where cost must be considered, ordinary lime water flavored with eucalyptol, menthol or cassia may be prescribed.

In some instances the patient should also be provided with orange wood sticks and powdered pumice stone.

It is a part of the dentist's duty to investigate and know where all these articles can be procured as prescribed, and see that the patient gets just what is ordered.

After seeing that the patient is properly equipped, the instruction in the use of these articles must be given. This has been a much neglected field in the past and our journals are full of articles which are no more enlightening than the following: "Instruct the patient in the proper use of the tooth brush." Either the writers do not themselves know and fear ridicule or they assume that every graduate has learned in college how to brush the teeth.

HOW TO USE THE TOOTH BRUSH

Now what is the proper use of the tooth brush? Out of hundreds of patients I have seldom found one that knew how to properly and advantageously use the brush. Surely there was something wrong with what these patients previously received in the way of instruction from the former dentist, if they received any at all. It seems quite evident to me that there are still a few dentists who do not themselves understand *scientific* gum massage and tooth brushing.

Let us begin at the beginning. The dental floss should be used at least once a day, preceding the brushing. It should be carried between the last two teeth on one side, avoiding snapping it past the contact point and wounding the gum, and the mesial and distal surfaces of each tooth well rubbed by drawing the floss back and forth to produce *real* friction. This process should be repeated between all the teeth in both upper and lower jaws. Having thus cleansed each inaccessible place and dislodged much debris we may now pass to the brush.

The brush should always be spoken of to the patient as *a "gum massage* and tooth brush," placing great emphasis on the gum massage. It should always be used dry to obtain the maximum degree of stiffness. When in use it should be kept well charged with powder. This is easiest done by placing a quantity of powder in a small whiskey glass and by tilting the glass the bristles may be rubbed into the powder until fully charged. This is a neat and cleanly way of handling the powder and avoids waste.

The lower laterals and incisors on their lingual surfaces are more prone to deposits of calculus than any other part of the mouth and hence require the stiffest bristles, so to that place the brush should be carried first. The tip of the brush being placed as far down as the floor of the mouth and the brush drawn with considerable pressure against teeth and gums, upward and out, thus simultaneously massaging the gums and brushing the teeth. This movement repeated until you are satisfied that these teeth have been thoroughly brushed, the attention may now be directed to the bicuspids and molars on both sides, on their lingual aspects. Here the brush is first placed well down upon the gum and the motion is again upward. This is continued until there is a reasonable assurance of cleanliness. Examination will reveal that lingual surfaces of lower bicuspids and especially the molars, just at the gum line, are almost invariably covered with a pasty deposit, fermentation of which keeps the gum irritated and tender.

Charging the brush again with powder the lingual surfaces of all the upper teeth are attended to by placing the bristles well up into the dome and brushing downward. When brushing the *lingual* surfaces of either upper of lower it will be found upon trial that the left side can be better brushed with the right hand and the right side better brushed with the left hand.

Recharge the brush and turn your attention to the buccal surfaces of the upper teeth. These are to be brushed by placing the brush well up under the cheek, bristles against gum and the motion is downward, always with a *vigorous* pressure against gum and teeth, especially in the molar region where calculus is very apt to form.

Charging the brush again the buccal surfaces of the lower teeth receive attention, the brush being placed well down on the gum and the motion made upward. It will be found that better work on both upper and lower can be done when the right side is brushed with the right hand and left side with left, just reversing what is done on the inside. The occlusal surfaces should be brushed in every direction and spaces given careful attention.

The whole mouth should now be brushed all over again with clean water, just as has been done with the powder, after which the mouth wash should be used. Every one does not know how to use the mouth wash either. A quantity equal to half a tablespoon should be held in the mouth for at least a minute, during which time it should be forced around with great vigor by the tongue and cheeks. Prior to using the wash the tongue scraper should be used, the tongue being scraped several times or until no more scum can be removed.

This program must be carefully followed at least once in 24 hours, and *should* be repeated after each meal. Here it may be well to state that a soda cracker or a piece of candy is the equal of a whole meal so far as mouth cleanliness goes afterward. The bacteria of decay are fed on starches and sugars, hence these substances are the most dangerous to have in the mouth so far as the teeth are concerned. The teeth should really be brushed and gums massaged every time anything is eaten.

Don't allow your patients to brush their teeth horizontally, commonly known as "cross brushing." Don't allow the use of toothpicks—insist on dental floss. Don't permit the use of improper brushes. Don't allow the use of gritty powders, tooth pastes or liquid dentifrices. Don't permit the use of only one hand in brushing. Don't let your patients tell you it's too much trouble; you should be well armed with arguments to convince them.

Insist on the mouth toilet three times a day, accept once a day *only* as an *unavoidable* compromise. Insist on the hard brush. Insist on brushing only one jaw at a time, brushing the gum as well as the teeth. Brush all the upper teeth down and all the lower teeth up.

Never permit a patient to retire at night without performing a perfect mouth toilet. Most of the mischief is done during the quiet hours of the night when the mouth is at rest. The patient may greatly assist himself by using harder and coarser drier foods than he has been in the habit of using, as these greatly aid in keeping the entire mouth clean and give the teeth exercise and massage the gums.

And last, but not least important, the dentist cannot expect to get anything like results from his patients unless he practices what he preaches. Strict oral hygiene is more important to the dentist than to the patient. How can one pose as a teacher and expounder of doctrine, then breathe a foul breath into the patient's face or expose to their view teeth which are unclean or tobacco-stained? If you ever hope to convince the public of the necessity of Oral Prophylaxis you must set the best example yourself.

THE SURGICAL TREATMENT OF CLEFT PALATE.*

By J. H. Jacobson, M. D., Toledo, Ohio.

OPERATIONS for the relief of cleft-palate, in the past, have usually been unsatisfactory. They have been unsatisfactory not only on account of the difficulties encountered in closing the cleft, but also as to the ultimate functional results, *i. e.*, the proper restoration of speech. In the hands of a comparatively few operators, the actual closure of the cleft was accomplished, but the ultimate results have always been more or less unsatisfactory. This state of affairs led to the belief, that as far as speech was concerned, a cleft which remained unoperated and was properly fitted with an obturator gave as good functional results as the cleft which had been successfully closed.

From our present knowledge, we know that this premise is incorrect We now know that accurate closure of the cleft, if accomplished early enough, will remedy the defective articulation, and that a failure to remedy this is due to a late operation, which cannot correct the deformed nasopharynx always present in such cases.

Much of the confusion that exists today in the minds of physicians and surgeons relative to the proper method and the results obtainable by the surgical treatment of cleft-palate, is due to the fallacies and operative procedures which have been handed down from one text-book to the other. The knowledge gained in recent years pertaining to the embryology, physiology and the surgical principles involved, has placed the treatment of cleft-palate upon a better surgical basis.

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*American Journal of Surgery, June, 1911.

The formation of cleft-palate and hare-lip is correctly understood from an embryological standpoint, as being a non-union of the naso-frontal processes, the proper union of which structures in the oral fossa should take place about at the fourth month of fetal life.

The variations in the length and breadth of the cleft, found in the hard and soft palate, as well as the type of hare-lip, can be readily comprehended from a proper interpretation of the arrested normal developmental phenomena of the oral cavity.

The exact etiology of the malunion of the maxillary processes with the naso-frontal process, resulting in cleft-palate, is not definitely understood. The most plausible explanation which we have at the present time, is that offered and apparently demonstrated by Warnekros,* of Berlin. Warnekros gives us the hypothesis, that in the "anlages" of supernumerary teeth, we have the explanation of the development of cleft-palate. He has made a number of examinations with the *x*-ray on embryos and new-born children with cleft-palate, which seem to prove his theory. Warnekros' explanation is that the "anlages" of supernumerary incisor teeth in the premaxilla, require more room for their development than do the normal number, and as these "anlages" ossify before the premaxilla and maxillary processes, therefore, the union of the latter is prevented.

Through the courtesy of Drs. Hess and Hartman, resident physicians of St. Vincent Hospital, of Toledo, Ohio, I have had an opportunity of examining a still-born fetus with cleft-palate, which was delivered at seven months. The specimen, and the microscopical section made by Drs. R. P. Daniells and F. M. Freeman, showing the presence of supernumerary teeth, are illustrated in Figures 1 and 2.

Further examination of many such specimens will be necessary in order to definitely prove that the presence of supernumerary teeth is the etiologic factor in the causation of cleft-palate.

The successful surgical treatment of cleft-palate began with Von Langenbeck, in 1861, who employed incisions along the alveolar border of the hard palate, pushing the muco-periosteal flaps toward the median line where they were sutured. The contributions to this subject by Dieffenbach, Brophy, Wolf, Ferguson, Mayo, Brown and Lane have all been in the line of real progress.

No single type of operation will serve for all cases of cleft-palate.

The Brophy, Ferguson and the Wolf methods give good results to those who are the most familiar with them.

I wish particularly to emphasize the principles of the surgical treatment of cleft-palate as given to us by Arbuthnot Lane, of London, believing that when Lane's principles of technic, and selection of the age for operation, are more generally understood, there will be a smaller percentage of failures following such operations. No other type of operation for cleft-palate has given, in my hands, such a high percentage of successes as has this method.

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*Warnekros, "Gaumenspalte," Berlin, 1909.

Lane described his method in an admirable monograph, published in London in 1908.* While this description is clear to one who has seen Lane himself do this operation, to others it is rather difficult to understand.

An analysis of Lane's technic shows that he employs three kinds of flaps to close the defects in the palate. For convenience of description and for clearer understanding of his method, we may call these the "primary flaps" (Fig. 3), and name them the raised flap, the reflected flap and the pivoting flap.

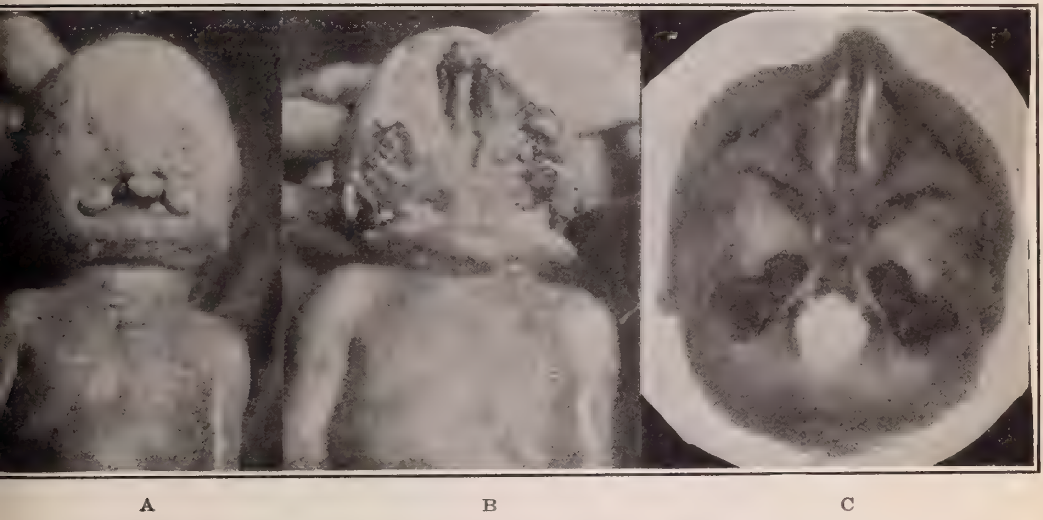

Fig. 1.—A, Fetus with double hare-lip and premaxillary piece; B, jaw removed to show the roof of the mouth; C, x-ray picture of a cross section of the same specimen. (H. W. Dachtler.)

The raised flap (Fig. 3,B) is an undisplaced muco-periosteal flap which has been raised from the hard palate by an incision along the inner border of the hard palate simply elevating sufficiently to allow a reflected flap to be sutured under and to it. The posterior end of this incision extends somewhat upwards on the nasal side of the soft palate and uvula, which provides a broader flap and allows a better suture and reconstruction of the uvula.

The reflected flap (Fig. 3, A) is a flap of muco-periosteum swung inward from one side of the hard palate by an incision corresponding to the length of the cleft paralleling the alveolar process and extending on to the soft palate to the tip of the uvula. This incision is joined anteriorly by a small transverse incision which extends inward to the free margin of the cleft. This reflected flap remains attached to the hard palate only at its inner border from which attachment it receives its nourishment. In wide clefts of new-born infants this reflected flap may be extended outward so as to include a portion of the mucous membrane of the cheek.

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*Lane, "Cleft-Palate and Hare-Lip," Med. Pub. Co., London, 1908.

The palatine vessels are severed in the formation of this flap. When this flap is swung into position the attachment along the free margin of the cleft acts as a hinge, and the oral mucous membrane is turned up into the nose and the raw surface is toward the tongue. This flap is always sutured to, and placed under a raised or a pivoting flap.

There is another type of reflected flap in the Lane technic which is employed when a double hare-lip and premaxillar is present (Fig. 5, B). It is a small flap consisting of the muco-periosteum covering the premaxilla that is reflected backwards and sutured to the other flaps. This aids greatly in the closure of the forepart of a complete cleft.

The pivoting flap (Fig. 4, C) is a displaced muco-periosteal flap used to close in the anterior part of wide clefts and is made to swing inward from the fore part of the hard palate. It is made by a U-shaped incision, one arm of which incision parallels the alveolar process while the other parallels the inner border of the hard palate; these arms join with each other in front, making the flap with an attachment posteriorly. From this attachment the flap will receive its nourishment from the posterior palatine vessels. A pivoting flap is always sutured to the raw surface of a reflected flap from the opposite side.

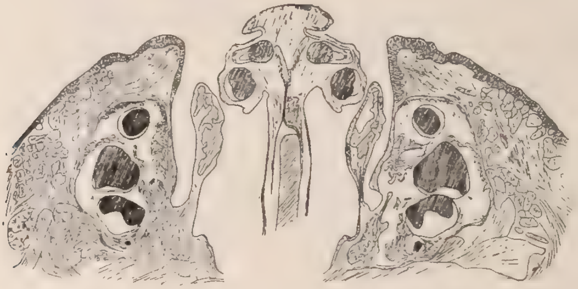

Fig. 2.—Camera lucida drawing made by Dr. A. M. Bush, of Toledo, Ohio, showing supernumerary teeth in a microscopical section made from specimen in Fig. 1. Instead of the normal number of three teeth in each lateral maxillary process, four are present.

With a proper combination of these flaps, any variety of cleft may be closed. In this way a cleft in the soft palate or an incomplete one in the hard palate can be closed by the combination of a raised flap with a reflected one. (Fig. 4.)

Complete clefts (Fig. 5) can be closed as above or with a pivoting and reflected flap to close the fore part of the cleft, and at a secondary operation, the posterior part is closed by a raised and reflected flap. Small supplementary flaps for completing the closure of the anterior end may be secured from the muco-periosteum of the premaxilla when such is present, or from the margins of the hare-lip. (Fig. 5.) The hare-lip is always closed at the same time for the reasons that the pressure of the lip on the premaxillary process will rapidly bring that process back into place, and also that the strips of mucous membrane removed in denuding the margin of the lip may be left attached to the lip and used to help close more completely the anterior part of the cleft.

The preparation of the patient for a cleft-palate operation is of great importance. Especially is this true when the patient is not operated during infancy, or, in those cases coming for operation after the first year, when it is impossible to completely sterilize the oral cavity and thereby make an aseptic operation. We can do much towards diminishing the number of bacteria which normally inhabit the mouth. In my own work I have adopted the method of preparation advocated by Cushing for stomach operations, that is: keeping the patient for a few days on a sterile diet, and feeding from sterile utensils. In addition to this I use antiseptic mouth-washes, clean the teeth with sterile tooth brushes, and use sprays for the nose. With such preliminary preparation we can obtain much better union after such separations than without it. For the proper per-

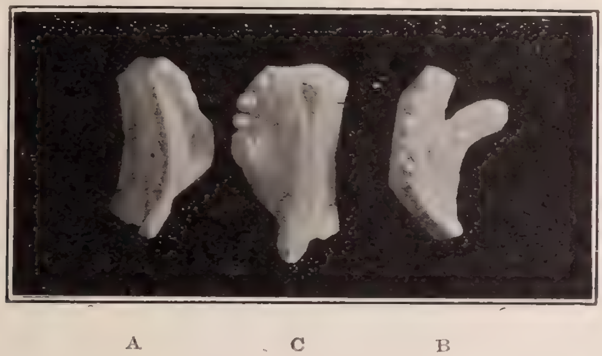

Fig. 3.—Primary flaps. A shows method of forming the reflected flap; B shows method of forming the raised flap; C shows method of forming pivot flap. Combination of two or more of these flaps will close clefts in either hard or soft palate

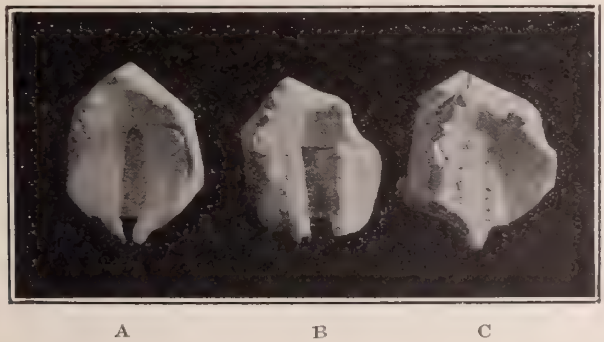

Fig. 4.—Method of closing cleft and soft palate. A, showing incisions for a raised flap on the right side and for a reflected flap on the left side; B, showing the reflected flap partly turned over with mattress sutures in situ; C, showing closure of the cleft by broad overlapping of the reflected flap under the raised flap. The mattress sutures are tied and an extra row of sutures introduced

formance of these preliminary measures it is very necessary that the patient be placed in a hospital in charge of a special nurse.

The position of the patient during the operation is of great importance. The best access to the mouth is obtained in the Rose position. For infants the shoulders and body are elevated by a pillow which permits the head to rest on the table thus making a modified Rose position.

The mouth is held open by suitable gags, Lane's gag for complete clefts, and the Whitehead gag for incomplete clefts. The latter instrument interferes with the work on the anterior part of the cleft when it is complete. The tongue is drawn forward by a silk ligature passed through the end and is held by an assistant throughout the operation.

The anesthetic employed is usually chloroform given on several layers of gauze held over the mouth by long forceps. Given in this manner I have had no difficulties from the anesthetic even with the youngest infant. The only special instruments which are needed for this work, is the needle-holder. A needle-holder for cleft-palate operations should be a long and slender one, so that it will reach the back of the palate and not hinder the view of the operator.

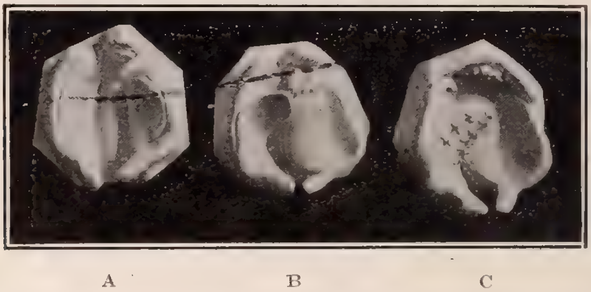

Fig. 5.—Closure of a complete cleft with a premaxillary piece. A, incisions for flaps—on the right side the formation of a pivot flap, on the left side a reflected flap, with a longitudinal incision along the inferior edge of the septum. Also an incision for the removal of the mucous membrane of the premaxillary piece. B, showing flaps reflected and method of introducing sutures; C, the closure of the hard palate is complete. The soft palate is closed at a secondary operation.

Lane has an excellent needle holder for this purpose. The right-angled needle-holder which I have devised (Fig. 4) serves admirably for this purpose. Small full-curved needles are used for placing the ligatures, which should be of the finest silk. (No. 00.) The sutures are mostly mattress sutures and their introduction is greatly facilitated by having a needle tied at each end.

The mouth and pharynx is cleansed by swabs, wrung from 0.5 per cent. iodine solution before beginning the operation. A complete cleft-palate and double hare-lip with the presence of a premaxillary piece is best operated upon in two stages. At the first operation, the anterior part of the cleft and the hare-lip is closed and at the second operation, a few weeks later, the defect in the soft palate is closed. All other clefts can be closed at one operation.

The formation of the various flaps needed to close a cleft must be determined for each particular case. These flaps should be thick; on the hard palate they consist of muco-periosteum, and on the soft palate of mucous and submucous tissue, so as not to injure the muscles of the soft palate. The anterior pillars of the fauces can be sacrificed in making such flaps. The soft palate is always detached from the posterior margin of the hard palate. The broad approximation of the flaps and bringing areas of raw surface in contact with each other without tension, are necessary for success.

The after-treatment consists of a continuation of the sterile diet, and keeping the mouth clean by cleansing with weak antiseptic solutions. The mattress sutures should be removed about the fifth or sixth day. The others need not be removed for they drop out of their own accord.

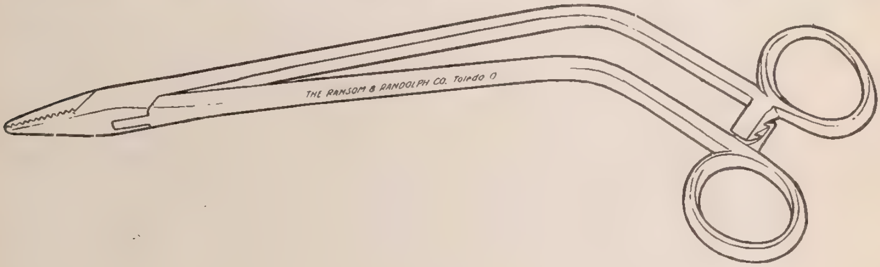

Fig. 6.

Exercises and careful systematic training in articulation and phonation are absolutely essential to success. Much depends upon the intelligence of the patient and the persistency with which this training is carried out. Even after very late operations, distinct articulation in a few instances has been obtained by the persistent efforts of intelligent patients

A great amount of confusion and many contradictory opinions as to the proper time for operating cleft-palate exist in most text-books.

The time is variously stated as being from the day after birth up to five or six years. Much credit is due to Lane who has emphasized the fact that proper functional results can be obtained only when the closure of the cleft is accomplished in the earliest infancy, *i. e.*, during the first few days after birth. The reasons for such early closure of the deformity are based upon sound anatomical and physiological principles.

The development of the nasal cavity and naso-pharynx does not take place until the maxillary processes are united and have formed the hard palate; this occurs about the fourth month of fetal life. In other words the development of the nasal cavity is absolutely dependent upon the closure of the hard palate. The deformed and undeveloped naso-pharynx is the real cause of the defective articulation after late operations, no matter how accurate the closure of the cleft.

According to Lane (*Cleft-Palate and Hare-Lip,* page 42), "in order to treat these cases as efficiently as possible, no time whatever should be lost in restoring to the nose its normal physiology, or, in other words, in giving back to it the mechanical factor which alone determines its development and that of the other structures dependent on it to a considerable extent for their normal form." Again (page 41), "the reason that the patient's intonation is peculiar, or, as it is usually called, nasal, is that the out-going air does not pass through the nose, and when the cleft is closed at the usual (*i. e.*, late) period, little space is left through which air can be transmitted.

If, however, the space is systematically and forcibly ventilated, the caliber of the naso-pharynx is increased and a considerable proportion of air passes through it so that the so-called nasal character of the voice is diminished very greatly."

It may therefore be said, in answer to the question, What is the proper age at which to operate for cleft-palate? the earlier the better; if possible, the first or second day after birth. The only exceptions are cases of debilitated and under-developed infants who have not the vitality to withstand the operative procedure. In such cases the operation should be performed at the earliest possible moment, within the first few months.

All cases should be operated upon before the child begins to speak.

The closure of the defect during the first or second day of life is well borne by these infants. This has been amply proven by Brophy, Lane and others and has been borne out in my own experience. The reasons for this are: that the new-born infant is always healthy (Lane, page 43), the capacity of its tissues to repair being at the very best; its digestion has not been impaired by experimental; and usually unsatisfactory feeding, and its resisting power reduced accordingly; it is apparently uninfluenced by the operation in that it does not cry or show any evidences of being in pain; it is never or hardly ever sick after the anesthetic and takes food within an hour or two of the completion of the operation; the loss of blood is slight, and the risk of life under ordinary conditions is very trivial indeed.

In conclusion, I wish again to emphasize: (1) the importance of the early operation; (2) the fact that a higher percentage of successful closures is obtainable by the Lane methods than by any other; (3) the advisability of a careful preliminary preparation of the patient, and (4) the great importance of post-operative training in articulation and phonation.

Employ thy time well, if thou meanest to gain leisure; and, since thou are not sure of a minute, throw not away an hour—Benjamin Franklin.

DENTISTRY FIFTY-SEVEN YEARS AGO.*

By Dr. C. Perkins, Newport News, Va.

IN presenting this article it is not the purpose of the writer to treat upon any of the modern methods of dentistry now in use or any that have come into use within the past forty-five years. I intend to confine myself as much as possible to the manipulations up to the year 1852, when I entered the field and commenced the practice under the light of conditions then existing, with no fore-sight but all hind-sight.

There was very little to guide the beginner. Those who had practiced dentistry in this country before this time had not left behind them many landmarks to guide the practitioner in traveling through the wilderness stretching out before him. Among the few who had gained distinction we find the names of Flagg, Lamair, Parkhurst, Tucker, Ambler and others.

Chapin A. Harris, of Baltimore, was regarded as the most scientific man of them all. He had laid a very good foundation for the Baltimore College of Dental Surgery, and had gotten a charter in 1839, and the institution added greatly to the development of the science. Yet Harris still adhered to the idea that the successful man could only acquire the mechanical knowledge by an apprenticeship and there were many who embraced the latter rather than the former idea.

The general public did not think that the field of dentistry extended beyond plate work, fillings and extractings. All the troubles of the oral cavity belonged to the general practitioner of medicine, who was also called in for such troubles as abscesses, ulcers, and in most instances for toothache. The display of ignorance on the part of the M. D.'s was shocking. The writer frequently met with little children only four or five years old with all the front teeth on the upper jaw pulled out. The cry was, "They will all ache soon and the best thing to do is to take them out. The permanent teeth will soon take their places." Again, I have seen children at eight, ten and twelve years of age without a front tooth in the upper jaw. On one occasion I was called on to put in a set of teeth for a boy of fourteen who had never erupted an adult tooth for the reason that all his teeth were extracted when a baby. It is therefore no wonder that Harris saw the great necessity of higher education. But with the mechanical dentist, gold plates and soft gold fillings carried the day. Tin-foil for the posterior teeth was regarded as an ideal filling and held front rank until the introduction of alloys and cements, none of which can rank with the old soft tin fillings. The writer has one in an upper molar that was put in fifty-seven years ago by Dr. David Cowling, under whom the writer studied. Dr. Cowling had taken up the study of dentistry after graduating in medicine. He lived with his family in Richmond and practiced in Tidewater. A more expert man in plate work and soft gold fillings has not graced the profession to this day. I have seen much of the plate work done by him that would compare favorably with anything of the present age, and if credit could be given for the difficulties under which he labored he would be entitled to wear the blue ribbon.

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*Read before the Virginia State Dental Society, 1910.

Dr. Blankenship practiced dentistry in Fredericksburg in 1845 and was remarkably expert in plate work. He swaged his plates from gold coin and made beautiful sets of teeth. Any man at that time who could work gold into form and insert soft gold fillings was considered equipped for the fray. But few men of fifty or sixty years ago had a college training and many of them who could flaunt their sheepskin relied more upon that than they did upon the solid realities of doing good work. The fellow who relied upon his own hard knocks would out-distance him every time. We had no use for Anatomy, Physiology, and the like in those days. A blowpipe, sledge-hammer, a Mason's blacking-box top, some beef tallow for fire and a few other odds and ends carried the day and won the trade—for trade it was then.

Dentistry fifty-seven years ago being the subject for our consideration. I will confine myself to a few reminiscences of the past half-century. The outfit for a country dentist at that time consisted of a fifteen-inch mouth blow-pipe, three wood boxes, three by eight, four quarts of foundry sand, one can of plaster, three pounds of lead, two pounds of zinc, two pounds of brass, a small sledge-hammer, a chunk of charcoal, one of Mason's blacking-box tops, a wad of cotton lint, two pounds of beef tallow, two pairs of pliers, one pair of snips and one pair of shears. With this equipment a country dentist felt himself well armed to tackle any case of plate work. The gold plates used ranged from 18 to 22 K. and from 24 to 28 G. The solder for all cases was usually made by the dentist from scraps and filings. 2-G. Spelter, 3 G. copper and 1 G. silver would be added to 20 G. gold and the melted product swaged out on a country flat-iron held between the knees. After preparing and fitting the plate, the next thing in order was the backing up the teeth with a separate piece of plate. These were assembled on the plate and properly adjusted to the bite, then invested in sand and plaster. After the investment had properly set, the case was put on an iron shovel usually used for taking up ashes and gradually heated in front of an open fire until the investment assumed a red heat. Then everything was ready to finish up the job with the fifteen-inch brass mouth blow-pipe, with the blacking box top to hold tallow and cotton lint for fuel. The case was next cooled down in front of the same fire, only the heating up process was reversed. Now came the time to try a man's soul—the stripping off of the jacket to find about one-half of the teeth checked, which was very common in those days. The make of the teeth was so poor that we all expected bad results. The manufacturers did their best and advertised "Superior quality, guaranteed" and all teeth broken in soldering were returned to be replaced free of charge. There was only one mail a week to Baltimore then.

As late as 1850 Chapin A. Harris in his "Principles and Practice of Dental Surgery," recommends the use of human teeth as preferable and lays great stress upon their beauty and natural appearance. He inserted a set for a lady in Baltimore as early as 1834, on a suction gold plate, using human teeth, and supposed that he was the first to do so, but Koeekie had used metallic base plates of gold and silver some time before. Gardett, of Philadelphia, had the honor of carving base plates from ivory so accurately that they adhered to the alveolar ridge by suction.

It has been said that Isaac Greenwood was the first to use gold as a base plate, but it does not appear that they were retained in the mouth by suction. The means employed for attaching human teeth to gold plates was indeed very unique. The tooth was cut in two at the enamel line with a saw and fitted to the gold plate, then a slot was cut about half the length of the crown of the tooth. Into this slot a piece of gold plate was fitted about an eighth of an inch longer than the depth of the slot and bent in towards the palatal arch. Holes were then drilled through the tooth into the gold plate and both neatly threaded for the retaining screws. The tooth and backing were fitted to the base plate, the bite taken, then the teeth were slipped off the backings, the case invested in sand and plaster, and the backings soldered onto the base plate. The teeth were replaced with screws and the whole polished.

The French were the first to manufacture porcelain teeth and for many years the shade and designs were so defective that they did not come into general use until about the year 1840, when the American manufacturer came to the rescue.

Among those who were extensively engaged in this manufacture were S. W. Stockton, J. Alcock, and Messrs. Jones, White & Co. The teeth manufactured by these gentlemen soon came into general use and were highly appreciated by dentists both in Europe and America. With this improvement Mechanical Dentistry was then considered to have arrived nearer perfection than its most sanguine and zealous cultivators dared to expect.

Compare the present with fifty or sixty years ago, and what have we now to say? It is surprising how little attention had been paid to the art of Mechanical Dentistry prior to the year 1850. Fanchard, Bourdet, Angerman, Maury, Koeker seem to have given it only a passing notice, but Delabarr's "Mechanical Dentistry" is a work of much merit and more explicit and descriptive of the means employed to replace artificial teeth.

Among the English writers, Robinson, a later author, has described more correctly the principles upon which artificial teeth should be applied. He does not, however, give us a description of the various manipulations through which a dental substitute should pass preparatory to its application. All of these writers seem to have entertained the idea that each operator should decide for himself the means that should be adopted to fit the case presenting for treatment.

Chapin A. Harris has given many cuts and diagrams to guide the practitioner but they are mostly very crude and would not at the present be considered. His idea was that the ability to properly prepare a piece of dental mechanism could only be acquired by a regular apprenticeship. To this any man of today will respond. Theory does not count, but practice every time.

The only place known to the writer at which gold plates could be gotten at this time south of Philadelphia was at old man Naudmeyer's in the rear of the Virginia House in Baltimore. His shop was about twelve feet square and you approached it through an alley about three feet wide. A very safe retreat for a gold beater. All instruments and mechanical tools were gotten at Arnold's, then an old man, near the Eautor House in the same city. Doubtless there were others that handled dental goods in some of the southern cities. Nearly all the tools bore the stamp of Chapin A. Harris, and to this day there are few superior to the class then made.

Forty-nine years ago the unfortunate struggle between the North and the South began and put a stop to the practice of dentistry in the country. At the close of the war, gold was too precious to be used and the Goodyear vulcanite plates took the lead. Goodyear, an Englishman, had patented the process of vulcanizing rubber about seventeen years before the close of the war, but had died within this time, and his heirs sold to Josiah Bacon the patent right for the United States. The process, however, had been used by dentists before the sale to Bacon. Bacon attempted to collect a royalty from all dentists who were then using the process or who might wish to use it. Nearly every one refused to comply, and a long lawsuit was the result. Bacon established his right to collect a royalty for a limited time, at the expiration of which the vulcanite base plate took the field, supplanting gold from that day to this, a development which is, to the mind of the writer, a blot upon the good name of Mechanical Dentistry.

Turning back fifty-seven years, will now give a few hints on soft gold fillings. We frequently met with exposed nerves then as well as now. We did not have any means of anesthetizing as we have now, consequently we made every effort to save the tooth and preserve the nerve. The most successful plan then in use was to take a thin scrap of gold plate, about 32 or 34 G., and trim to correspond to the base of the cavity. This scrap was placed on a piece of lead or soft wood, countersunk with a round burnisher and placed in the cavity, convex side up, thus leaving a safe retreat for the nerve. This little cap was never allowed to extend out to the free margin of the cavity. The next step was to take No. 4 or 6 soft gold foil and fold four times, then roll into a cylinder until it was about the size of the cavity. After placing this in the cavity it was expanded from the center with a cone-shaped plugger until it was firmly adjusted to the walls of the cavity. The center was then packed full of foil until it corresponded with the free margin of the cavity. The overhanging edges were folded towards the center and tightly malleted down; finally the filling was trimmed and burnished.

None of the new "fandangled" golds of to-day will make so perfect a filling and there are very few now who would attempt to use it. I would not, because I have jumped into the Band-Wagon with the rest of the boys. Other cavities were filled with ribbons of gold folded from four to eight times and placed in the cavity, always beginning to pack against the walls and margins first. Tin foil was handled in a like manner with good results.

Fifty or sixty years ago it was found necessary to replace crowns on the roots of the eight or ten front teeth. We had no cements with which to fasten metallic dowel-pins in those days and had to resort to pins made of tough white hickory. These were made smooth and perfectly adjusted to the root-canal, but not driven in for fear that the absorption of moisture would so expand the pin as to cause the root to split. Therefore great care was taken not to have the dowels too large,—just the right size to be forced into place by the fingers of the operator. The crowns were adjusted in the same manner and it was astonishing to see how very firm they would be in a few hours' time.

After the introduction of cements the dowels in some instances were made of gold and screwed into the root, then the crowns were cemented on. It was easy to remove the dowels if the crown was broken or if the dowel for any other reason had to be taken out. The reamers for the root canals were usually three-cornered, tapering to a point, and the work of shaping the canals was done by hand. But little attention was given to the cleansing or filling of the canal above the end of the post, but to provide for the secretions of the open canal above the end of the post, a small groove was cut in its side to afford drainage.

You gentlemen of to-day with the wide fields of knowledge spread out before you, the interchange of ideas through the monthly publication of dental journals, your dental society meetings, dental appliances of every description, all the newest improvements at your office door, cannot appreciate the difficulties of a country dentist of fifty-seven years ago, and I congratulate all of you that you live in a day of greater light and more advanced conditions. May you go forth with higher aims and nobler aspirations and foster a spirit which will so facilitate the great strides of the last half-century that the development of the present day will be but a half-way station to the progress of fifty years hence.

Where one man shapes his life by precept and example, there are a thousand who have it shaped for them by impulse and by circumstances.—Lowell.

ORAL HYGIENE.*

By Dr. M. B. Rudd, Richmond, Va.

DR. EUGENE S. TALBOT says: "If dentistry is to be judged before the bar of an enlightened public opinion, its sentence might be severe. In no line would its shortcomings be more manifest than this: that it has not so educated the public that the rudiments of dental knowledge are common among the people." What the doctor says is true. The members of the profession in the treatment of dentistry, have lacked comprehensiveness of duty both to the profession and the public. They have laid too much emphasis on the simple ways and means of performing certain operations. Had we devoted more time to the instruction of the public as to its oral conditions and constitutional diseases which are the results of unhealthy mouths, the profession would rank very much higher in the good accomplished and would be held in greater appreciation by the community. The dental profession of Virginia has sadly neglected Oral Hygiene. 'Tis true, many attempt to teach their patients that defective teeth and an unclean condition of the mouth have a detrimental effect on the general health. Dr. D. D. Smith, of Philadelphia, in a lecture on hygiene six years ago, said that he had seen nervousness, irritation of the kidneys and gastric catarrh cured by no other treatment than repairing decayed teeth and disinfecting the mouth. Dr. Evans, the health commissioner of Chicago, says, "there is nothing of more importance to the individual than nutrition, and proper nutrition is not to be had with diseased teeth and unhealthy mouths." Dr. William H. Allen, Secretary of the Bureau of Municipal Research, says in his book, "Civics and Health," the individual with decayed teeth, even unclean teeth, is open to infection of the lungs, tonsils, glands, ears, nose and stomach." Dr. W. D. Miller, Professor University of Berlin, points out in his book, "Micro-organisms of the Human Mouth," that an unclean, unhygienic mouth furnishes an ideal culture medium for almost all disease germs. We have all seen that defective teeth cause indigestion and intestinal disorders. The organs of the body suffer when the food is not assimilated. Decomposed food products with the environments in a mouth, can furnish germs in sufficient quantities to infect a regiment. Progress along hygienic lines has been slow. Oral hygiene has not proven an exception to the rule Where it has been inaugurated in this country it, at first, met with much opposition and little co-operation. If every one of us would become enthusiastic and do his little part for oral hygiene we would shortly have a greatly improved condition in Virginia. We have a few enthusiasts. They have dwelt on the subject and have at length aroused some of us who have been dormant. To young America, "an ounce of prevention is worth a pound of cure," and it is the child that needs our thought and care. We must climb into the wagon of Progress and devise means of teaching them the importance of a healthy mouth.

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*Read before the Virginia State Dental Society, 1910.

We have in the profession men who have preached the doctrine of oral hygiene for years. The seed has fallen on fruitful soil. The German army has an inspection of teeth and tooth brushes every morning. There are also several German insurance companies that give free dental treatment to their policy holders as a means of prolonging the lives of the risks. Congress passed a law to prevent the sale of impure foods. Would it not have been well to have had included in that law a penalty for filthy, unsanitary mouths? In the United States the percentage of unhealthy mouths is variously estimated. *The Dental Digest* places the figure at 90%. There have been no estimates below 80%. Campaigns against this deplorable feature of the public health are now being waged by New York, Boston, Chicago, Cincinnati, Cleveland, Rochester and many smaller cities. Cleveland, Ohio, however, was the pioneer in this movement of oral hygiene in the United States. The profession in Cleveland overcame great obstacles; have gone farther and their accomplishment is more far-reaching than in any other of our great cities. The Cleveland campaign began in September, 1898, and has been appreciated by progressive men who are familiar with this work. The Cleveland Society appointed a committee whose plan was to have district dentists make examinations of public schools; to have a dentist in the medical faculties in order that the students might learn the fundamental principles of dentistry and oral hygiene and to enlist the co-operation of the Board of Health. The committee tried, but failed, to enlist the co-operation of the Medical Faculties, the Board of Health and the Board of Education. However, they enlisted the interest and support of the Superintendent of Schools and he agreed to have the children taught whatever the committee furnished. After several years of effort the Boards of Health and Education evinced sufficient interest to permit the examinations of the schools. The result was appalling. 15,061 cavities were found in the mouths of the first 2,677 children examined, and when the committee reported its findings the Boards co-operated willingly and enthusiastically. Four clinics were established and a course of lectures for parents and teachers on oral hygiene were inaugurated.

Medical men are the health guardians of communities. They have taught the people to guard against malaria, typhoid, yellow fever, diphtheria and many other diseases. Hygienic measures have saved communities, repeatedly, from epidemics. We dentists have hung back like a bashful boy at a dance; we have, by our own indifference, failed to do our duty by the public and by posterity in this all-important matter of oral hygiene.

Gentlemen of this convention, we know these unsanitary conditions exist; we know that oral hygiene should be taught; and we should every one be willing to aid in this important movement for the public weal. The question is, How? As the question of the public's health is concerned, I suggest that we enlist the co-operation of the State Board of Health. As it is a question of education, I suggest that we follow in the footsteps of Cleveland, which has blazed the trail, and ask co-operation of the State Board of Education.

The public schools were inaugurated for the purpose of teaching children those things which will best fit them for a life of usefulness, in order that they may be a credit to their community and state. The school days are the impressionable ones. The unhealthy child is slow to receive impressions. With healthy bodies go vigorous minds, therefore this branch of health we must teach. The present instruction in oral hygiene given in the schools of Richmond consists of a couple of pages in "Human Physiology" by Ritchie, of William and Mary College. What is taught is very good as far as it goes, but it is totally inadequate. It does not impress one with this important fact, that upon the condition of the mouth and teeth depends healthy digestion and proper nourishment. Can it be expected of an M. D., with his limited knowledge of the teeth and their diseases, the sanitation of the mouth and its general systemic benefits, to fill his book with important facts on this subject? Oral hygiene should be made interesting to children in order that it will make a lasting impression. To whom do the people look for this instruction? To the Dental Profession, which studies this part of the human anatomy for the purpose not only of obtaining a livelihood, but that they may teach those in darkness the road to health and happiness. Gentlemen, we have thought some, and done little; we have talked a great deal and still done practically nothing to teach the benighted public the needs for oral hygiene. Shall we sit with our hands folded and see the great work of enlightenment carried forward, and hide *our* light under a bushel measure, for lack of suitable energy? We owe it to our intellectuality; it is the superior education we were so fortunate to receive and we owe it to the grand old Commonwealth of Virginia that we take the "bull by the horns" and bestir ourselves. The time for talking is past, the time for action has arrived. I, therefore, respectfully suggest that this convention appoint an Oral Hygiene Committee whose duty it will be to enlist the sympathy and support of the Boards of Health and Education in this great work of instruction and report annually its progress. It is a duty we owe—will we shirk it, or will we show to the world that there is in Virginia a body of men broad minded and generous, ready and willing to take up the cudgels in behalf of those who sadly need instruction in oral hygiene?

OXYDASE IN SALIVA

By M. H. Carlton Smith and C. Franklin MacDonald, Jr., Boston

THE following series of experiments are the outgrowth of our attempt to answer the question regarding the presence of a germicidal agent in the saliva, asked by Dr. H. C. Ferris as correspondent for the New York Dental Society. At about the time we received his communication our attention was called to an oxydizing enzyme which was shown to exist in milk and immediately the possibility of such an enzyme being present in the saliva suggested itself as perhaps being an answer to Dr. Ferris' question.

Enzymes distinguished by their power to induce chemical changes by means of the utilization of oxygen and hence known as oxydizing enzymes are of increasing importance. The fact that these ferments may be rendered inert by slight departure from the normal condition, addition of alkaline or acid, explains in great part at least why they have not been isolated and more thoroughly studied.

Oxydases have been found to exist in milk, in blood, nasal mucus, tears, and semen, in many of the organs, and also the muscular tissue. They exist moreover in the vegetable kingdom from which the subject of oxydizing enzymes was first studied by Bertrand and Bourquelot.[1] The urine, bile and intestinal secretions are said not to contain a ferment of this kind.

All samples of saliva give evidence of containing an oxydizing enzyme, [2]Paul Carnot claiming to have found it in the salivary secretions of babies only a few months old.

In testing the saliva we find the most satisfactory reagent to be pyrocatechin. Guaiacum has been used perhaps more than any one substance as a test for an oxydase, but is the least truthworthy.

Pyrocatechin responds to only one or two occasional constituents of the saliva other than the oxydizing enzyme.

The reagents used were selected from a number mentioned in Pierre See's "Des Applications Therapeutiques Des Oxydase et des Metaux Ferments" as being best adapted for the particular purpose of detecting an oxydase in the saliva, and were as follows. A tincture of guaiacum; a solution of guaiacum of 75 per cent. solution of chloral hydrate; pyrogallol: hydroquinon and pyrocatechin; Paraphenylene-diamine in solution with sodium carbonate and alpha-napthol, in molecular proportions, was also used, and while the reaction was immediate and well marked, it was rejected as a test for oxydase because simple exposure to air gives a purple color which would be likely to lead to erroneous conclusions.

In testing samples of fresh saliva with solution of guaiacum it is necessary that the sample be made neutral or slightly acid, the acidity being best produced by either lactic or acetic acids, as mineral acids prevent the reaction. The color produced was blue. Pyrogallol gives a brown turning almost black as the reaction continues.

Hydroquinon and pyrocatechin in a neutral or slightly alkaline medium only,[3] give a light brown, turning to a red-brown as reaction continues. These reactions took place with every sample without exception.

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[1] Enzymes and their Applications, Effrant: Prescott's translation. This work is also authority for statement immediately preceding regarding the sources of oxydizing enzymes.

[2] P. 52, Soc. Biol., 1896, t. XLVIII.

[3] These tests have been obtained in slightly acid solution, but we do not consider negative test under such conditions as at all trustworthy.

Heating to 100° C. will kill any oxydase present, therefore a number of samples of saliva were heated to 100° C. and after cooling tested in a similar way to the unheated salivas. The result of this process was that with guaiacum solutions about one-half the trials resulted in the production of the characteristic blue color; with para-phenylene-diamine only a slow reaction if any took place; with hydroquinon the reaction always took place but very much slower than in the unheated saliva; pyrocatechin gave no reaction at all in any sample tried, even after a number of hours' standing.

These results showed that something other than an oxydase must be present in the saliva which was able to produce this change of color, with all the reagents save one.

To ascertain what constituents of the saliva might enter into this change of color the following substances were tested with the reagents with results appended:

The reagents used were the tincture of guaiacum, and solution of guaiacum, also pyrogallol, hydroquinon, pyrocatechin: 5 per cent. solution of each in distilled water. The solution of guaiacum is made by dissolving 75 grammes of chloral hydrate in a 100 c.c. of water, then adding to this enough gum guaiacum taken from the center of a freshly broken piece to make about a one-half per cent. solution.

The solutions to be tested were not made of any particular strength except to be about 1 per cent.

	Sol. Guaiacum	Tinct. Guaiacum.	Pyrogallol	Hydroquinon	Pyrocatechin
1 NH_4Cl					
2 $(NH_4)_2SO_4$	2 Sl. Bl.4chBl.	4 Gr. Bl.	5 Sl. yel.	5—6—	6—
3 KCyS	5—	4 Gr. Bl.	5 Sl. yel.	5—6—	6—
4 KCl	2 Sl. Bl.4chBl.	4 Gr. Bl.	5 Sl. yel.	5—6—	6—
5 KNO_3	3 ch. Bl.	4 Gr. Bl.	5 Sl. yel.	5—6—	6—
6 $NaNCO_3$	4 Sl. Bl.	5 Sl. yel	5 Sl. yel.	5—6—	6—
7 Na_2HPO_4	3 Gr. Bl. 4Bl.	4 Sl. yel.	2 R. B.	2Sl.B6ch.RB.	5 Sl. yel.
8 NaCl	3 Gr. Bl.	5—	2 B.	2Sl.B6ch.BR.	6—
9 $NaNO_3$	2 Sl. B14chBl.	4 Gr. Bl.	5 Sl. yel.	6 Sl. B.	6—
10 $NaNo_2$	4 Sl. Bl.	4 Gr. Bl.	5 Sl. yel.	5—6—	6—
11 Albumin	1ch. Bl.	2 yel. 5 yel. B	6 Sl. B.	6 Sl. B.	5 Sl. yel.
(egg)	4 yel. Bl.	4 yel. Bl.	5 Sl. yel.	6 Sl. B.	6—
12 $(NH_4)_2C_2O_4$	5Sl. Gr. Bl.	4 yel. Bl.	2 Sl. yel.	6 Sl. yel.	6—
13 Urea	5—	4 Gr. Bl.	5 Sl. yel.	5—6—	6—
14 Na_2CO_3	5—	4 yel. Bl.	2 R. B.	2 ch. R. B.	2 Sl. B. 5 deepe
15 $Na_2C_2O_4$	5—	5—	5 Sl. yel.	6 Sl. B.	6—
16 Mucin				2Sl.B6ch.RB.	6—
17 H_2O	5—	5—	5 Sl. yel.	5—6—	6—

1=30 seconds, 2=30 minutes, 3=1 hour, 4=3 hours, 5=6 hours, 6=12 hours, ch;=characteristic, B=Brown, R. B.=Red Brown, Bl.=Blue, yel.=yellowish, Gr. Bl.=Greenish Blue, Sl.=slight.

It will be seen that pyrocatechin, practically is without action until several hours have elapsed, except a very slight coloration apparently due to minute trace of sodium carbonate. If we assume the assertion of Professor Chittenden to be correct that Na_2CO_3 does not normally occur in the saliva and even under abnormal conditions is extremely slight, this may be disregarded.

From the above results it is reasonable to reject guaiacum solutions, pyrogallol and hydroquinon as a test for oxydase in saliva. For when can one be certain that other constituents, very minute in quantity, to be sure, but nevertheless exerting their influences, are vitiating the reaction, especially when the rapidity and intensity of the reaction is to be used to estimate the strength of the oxydase present. That there is an oxydase present all these reagents show, but the relative power of the enzyme cannot be truly judged by them.

Two reagents suggesting possibilities, but which, on account of the difficulty of procuring, were not used in these tests, are phenolphthalin (reduced phenolphthalin) and the leuco-base of malachite green. The former is recommended by J. H. Kastle and O. M. Shedd in the *American Chemical Journal,* No. 26, 1901, and the latter by Wilhelm Adler, *Zeitschrift fuer Physiologische Chemie,* No. 41, 1904.

Having settled upon a reagent which is reasonably certain as a test for an oxydase, a few experiments were made to determine if possible the origin and also some of the characteristics of the oxydizing enzyme.

In regard to the origin of the oxydizing agent, i. e., the cause of the reaction, four possibilities suggested themselves: 1st, the reaction was produced by a micro-organism existing in the mouth; 2nd, the reaction was the product of the vital activity of micro-organisms; 3rd, the oxydizing agent exists as a hitherto unknown biochemical property of the diastatic enzyme, ptyalin; 4th, the oxdizing agent is a distinct and separate enzyme, the result of the vital activity of the body, presumably of the salivary glands.

To disprove the first of these suppositions: the following tests were made: To a few c. c. of saliva an equal portion of a 1 per cent. solution of phenol was added, thus making a total phenol solution of 0.5 per cent.

Another test consisted of adding to saliva more Squibb's ether than it could take up, reagent then added and in fifteen minutes the characteristic reaction was present.

According to Dr. W. D. Miller, American System of Dentistry* in these two cases the micro-organisms would be destroyed or at least greatly inhibited in action, while the ptyalin remains unaffected.

The reagent used in all these tests was a freshly prepared one per cent. pyrocatechin and upon the addition of this reagent the characteristic reddish brown color appeared in about fifteen minutes.

A third test was to pass the saliva through a Chamberlain germ proof filter by means of suction, this experiment continuing over two days. Filtered portion tested with reagent and in fifteen minutes a characteristic reaction. Incidentally the diastatic action of the filtered saliva was tested by a starch digestive experiment and a positive result occurred showing that ptyalin can be passed through a Chamberlin filter.

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* Page 794, Volume I.

Our next experiments were carried on to ascertain if the oxydizing power was contained in the enzyme ptyalin. To determine this a test tube of saliva was placed in a water bath and heated to a temperature of 57° C. for twenty minutes which, according to Dr. W. D. Miller, destroys the diastatic action of the ptyalin. At the end of twenty minutes a digestive experiment was made with starch and as there seemed to be some slight action, the saliva was again heated to 57° C. for ten minutes more, at the end of which time no diastatic action took place even after thirty minutes. This same saliva was now tested with reagent and in fifteen minutes a characteristic reaction took place. This shows that the oxydizing power does not reside in the ptyalin unless we assume that only the diastatic action of the ptyalin is destroyed at 57° C. which, of course, there is no means of showing. It seems more reasonable, however, to assume that the ptyalin possesses only the property of diastatic action.

With regard to the oxydizing enzyme being the product of the vital activities of the micro-organisms, we should expect to find in the saliva collected without paraffin, that is without mastication, the same strength of reaction as in other samples collected with paraffin, since the enzyme should be constantly present in the mouth, being elaborated by the organisms.

In samples of saliva collected without paraffin and tested with reagent, in thirty minutes only a slight color was discernable and not until after forty-five minutes could it be said that the reaction was characteristic.

Salivas from the same sources, but collected with paraffin, gave a characteristic color reaction in fifteen minutes. We know that saliva as it comes from the glands is uncontaminated with micro-organisms, therefore the enzyme is not the result of the vital activity of the micro-organisms.

Hence, by a process of elimination the conclusion is reached that we are dealing with a separate and distinct oxydizing enzyme.

Oxydizing enzymes have been divided into two classes known as the ozydases and the peroxydases. The oxydases are those enzymes which by their own independent activity produce chemical changes indicative of the utilization of oxygen. The peroxydases, on the other hand, are those enzymes which act as intermediaries between a supply of oxygen and the substance to be oxydized; that is, they do not elaborate their own oxygen but simply carry it from one combination to another, as from air to substance.

To determine whether the oxydizing enzyme we are dealing with is an oxydase or a peroxydase tests were made in an atmosphere free from oxygen (CO_2) with positive results in each case. These tests do not exclude the possibility of air being in the watery medium since it was impossible to boil, as this destroyed the enzyme.

Another test was made under the receiver of an air pump and in fifteen minutes characteristic reaction had taken place. In this test, as in the preceding, the same possibility of dissolved oxygen is present, but this as well as the possibility of a somewhat imperfect vacuum can be passed by, since no difference whatever could be distinguished in the rapidity nor appearance of the reaction.

From these tests we assume that an oxydase is present. When making a test for oxydase in a tube of saliva it is noticeable that the strongest color always appears at the surface of the liquid, thus indicating a peroxydase; that is, transferring the oxygen from the air to the reagent. Thus, in naming this enzyme we can borrow a bacteriological term and call it a facultative oxydizing enzyme. At any rate, it is probable that while the enzyme has the power of doing its own oxydizing, it will also utilize free oxygen whenever opportunity offers.

A few tests were also made as to the amount of heat the enzyme would stand and it was found that ten minutes at 70° C. or 75°C. did not destroy its power: that two minutes at 80° C. or 85° C. did not impair its reaction, but two minutes at 90° C. greatly impaired its reaction so that at the end of thirty minutes only a very slight pink color was present. Carried to a temperature of 100° C. in a water bath its reaction was destroyed.

Lactic acid when added in sufficient strength to cause an acid reaction of litmus paper, greatly retards the action of the oxydase.

The oxydase does not dialyze through parchment, but can be evaporated to dryness in a vacuum at 48° C. without destroying its oxydizing property.

The oxydase in a sample of saliva gradually deteriorates but this process is variable; one sample from a healthy person being kept for over three weeks with but slight loss of power, while a number of salivas from hospital patients, after five days, were greatly reduced in power.

CONCLUSIONS

We may briefly summarize this work as follows:

First. That human mixed saliva contains an oxydizing enzyme distinct from ptyalin.

Second. That the enzyme exhibits the properties of both an oxydase and a peroxydase.

Third. That it is a product of the body (probably glandular) metabolism and may be increased in quantity, or activity by mastication.

Fourth. That it is more resistant to heat than ptyalin but more easily destroyed by acids.

Fifth. That the color obtained with a freshly prepared 1 per cent. solution of pyrocatechin is sufficient test for this enzyme in saliva.

IF YOU PRACTICED DENTISTRY IN A SMALL WESTERN TOWN, WOULD YOU LET YOUR PATIENTS CALL YOU "DOC"?

By Horton F. Kimball, D. D. S., Salmon, Idaho

WOULD it make you "pretty mad" and would you "call" them for it? If they call you "Doc" and you get their money, would it make any difference? Supposing you get their friends as well as their money and they "plug" for you, besides giving you the reputation of being the "squarest and best little dentist"—and all that rot, you know, would it make you "fighting mad?" Well, I wonder if it would. You know, all of you who practice in a small place and you have all been called the "squarest and best," but do you "stand for it?" Supposing the mercury was some degrees and then some below zero with the snow waist and a half deep to a tall Indian; you had just told your girl (assistant, I believe she is called in a city) you were afraid there would be some broken appointments to be paid for on such a day, when the reception door would open and a bulky, fur-clad figure would pull off his Stetson, unwind a silk handkerchief from around his ears and in a tone which betokens the "ranch boss's" voice, would greet you with a grin and a "good mornin', Doc," would you go into details with him? Guess maybe you would think twice, yes? Especially if you recognized him as a man who ranges some 8,000 or 10,000 horses out in the hills. You get him in the chair, make an examination, realize almost at a glance that pyorrhea has most of the teeth in its grip and that he will never "stand for" treatments, prophylaxis and all those things, so what are you going to do? You are going to "put it up to him" as one man to another and let him reason it out for himself, which he sure does with amazing alacrity. You call his attention to the fact that a number of his teeth are loose, gums receding, pus pockets, etc., and only the second bicuspids perfectly solid and apparently not affected by the disease, also that those which are decayed are really not worth trying to save.

He thinks a minute or so and then asks, "What is this disease you speak of? I ain't had nothin' the matter with me for years except a bad stummick." You go into details and he finally says, "Well, that is queer, durned queer; to tell the truth, I was in Doc Jones' office a few months back and he said nothin' about it; he wanted to fill some of 'em and crown a couple; said it would cost me sixty dollars and I thought it was too much money. Then I talked with Pat Grandy and he said you made him some teeth that stick, but I allus heard you charged too high. What can you do about this?

"Can you give me something to chew with and do you reckon it will help my stummick as you say? I never thought of swallowing that pus every time I swallowed any grub?"

Now, here is right where you shine, if you have read "Brother Bill with the big idea," and you explain that you can give him satisfaction in a number of ways; first and cheapest by extracting all his teeth and putting in full upper and lower plates of rubber; that, if he wants to have something better, you can use "aerdentalloy" upper and Watt's metal lower, but that a full plate will be a mighty hard thing to get accustomed to, getting mixed up with his food innumerable times and cause him no end of embarrassment at the table. You tell him that if he is going to decide on having a full plate that there are really but two kinds, one of gold and the other of baked porcelain.

You end with *But* I should advise leaving those bicuspids (let him have a hand-glass and point them out to him) and have partial plates, extracting all the others.

Tell him you would devitalize them (that means some more elucidating) and crown them with gold, then make your plates with attachments to fasten to these crowns which will hold them in perfectly solid and you cannot cough or sneeze them out nor get them mixed with your food. Yet, it is an easy matter to remove them for cleaning and just as easy to replace them. You explain fully the necessity of cleaning them with a brush and sapolio (if of vulcanite) before retiring and advise leaving them out at night.

Remember, he is like a child and you are going into the simplest of explanations so he may understand you fully; he is "soaking up" every bit of this information, even though he doesn't appear to be doing so. You tell him the best plates you can make for him with these attachments would be of gold and explain why gold is better.

Finally, you end with, "Now, the cost of these, etc." Gold sounds well to him, but the cost is having quite a struggle for mastery; maybe these plates will not give as perfect satisfaction as you think, after all, even though you did fit out Pat Grandy with something that he can eat anything with. He will probably decide on the vulcanite partials with attachments; you extract those teeth that are necessary, he makes a payment and you ask him to drop in next time he happens to be in town so you may see how rapidly his gums are settling. Sometimes a little prescription for a mouth wash makes him think more of you—it sure makes the druggist appreciate you more, and the patient eventually drifts back when the gums are healed, sore spots all gone and you fit him with plates, calling his attention to the fact that by means of these attachments you are enabled to make him practically a "roofless" upper plate so it will not interfere with his sense of taste. You get his hundred or hundred and a quarter and it swells your bank account; makes you think that you will soon be able to get that switchboard to go with your compressed air apparatus and that you will get the cash discount as well.

I say, if you were practicing in a small western town, had you rather be called "Doc," "Doctor" or "Mister," or would it make you mad if you were called anything but "Doctor?"

METHOD OF MAKING THE CLASP DENTURE

By the way, it might be in order to explain a little more fully about these attachments. They are nothing but clasps, but probably made a little different than some of you make them. One being in a small place is obliged to think out things in cases of necessity. After the crowns are cemented in place, take wax impression of upper and lower jaw; I suggest wax because it is quicker and neater than plaster. Add salt to the plaster and run impressions, separating in a few minutes. Take vaseline, oil or lavalin, whichever comes most convenient, and oil the plaster models of the crowns.

Cut some strips of common yellow base-plate wax of a proper width for clasps, warm them slightly, press to shape around plaster crowns, trim off, cool, bevel and get them as you want them, then drop into a glass of cold water. Do the same for all four crowns, then get out your multiple sprue former, attach sprues to wax clasps and invest all four of them at once. While heating up flask, take a couple of dwts. of 22k. gold scrap and about a third of that amount of platinum or platino-iridium (generally there is some of the latter with your platinum scrap), put on charcoal block, add a little flux and apply heat. Sure, it is easy to melt platinum; the gold melts first and envelops the platinum, causing it to melt quite easily. Get out your "Elgin" and cast all four clasps at once; trim them with stones and sandpaper disks, then use some scrap gold to make "tail-pieces," strengthen with 18k. solder and you have clasps that will not bend any easier than as though they were of regular clasp metal. You can have them of any width or thickness you desire and it is impossible to get a more perfect fitting clasp. It is a great deal quicker than the old method of bending your clasp and is stronger; pickle in muriatic acid and in this way a partial plate cannot do anything else but fit. Is it any wonder that "Pat Grandy" had no difficulty in eating any old thing? I never make a partial plate without these clasps. You get the price of your devitalization, your crowns, your clasps and your plates, all in one and your patient goes away satisfied. Neither are you ashamed to ask him, next time you meet, how he "gets along," and you will find it is a mighty good paying investment, because he will be sure to recommend all his friends your way. You get the reputation, you get the money and do you think it is worth while to feel "sore" if they call you "Doc?"

HOW TO MAKE A SHELL CROWN

One more thing about this combination. I make all my crowns as follows, but maybe you do not (shell crowns, I mean). We all know there is nothing that will wear out a crown quicker than to have it occlude with a porcelain crown or tooth. Fit your band, trim the root as low as you want it, contour band, soften a piece of inlay wax, press over top of band and have patient bite. It is advisable to have a thin piece of dam over the wax. Remove band and wax intact, trim, carve and, if the wax runs down into the band too deeply, trim part of it out with an excavator or draw it out with an old chip-blower. Cast. You get a perfect occlusion and your crown will never wear through—also, you will get better fees for a crown of this kind. With a little practice it is as easy to carve this wax as it is to carve plaster. If the sulci aren't deep enough, use a small round bur and deepen them. A stiff engine cleaning brush, rapidly revolved in the engine, and a little pumice, will take all the scratches out of the occlusal surface and it is an easy matter to sit in your own chair with one foot on the switch of your engine while you are doing it. Well, I wonder if it is?

ORTHODONTIA AND THE GENERAL PRACTITIONER.*

By H. W. Campbell, D. D. S., Suffolk, Va.

THE knowledge of the subject of orthodontia has progressed to such a degree in the last ten or fifteen years that it would now be impossible in a paper the length of this to even touch upon the most important points relative to the science.

The specialization of this branch has brought out the best thought and the best work of not a few of the brightest men in the profession in America, and when we review the work accomplished and the literature created by them it is indeed a revelation.

In no field of the profession has more been accomplished by the specialist than in this. The marvelous transformations which have been wrought in the facial expression of those deformed and unsightly human beings whose masticating mechanism is disarranged by diseased conditions or neglect, can now, under the hand of the skilled orthodontist, be brought into symmetry and even be made to assume beauty.

I do not propose, however, to discuss the subject from the standpoint of those whom we recognize as specialists in this work, but rather that I may give you a few thoughts on the subject from the experience of one who is in the general practice of dentistry, and as a consequence is confronted many times with the perplexing problem what best to do in cases where it is clearly the duty of the dentist to offer suggestions and actually perform operations for the correction of deformity in the mouths of his patients. It often happens that with very slight assistance nature will help us to perform remarkable results which will be a source of gratification to ourselves and a benediction to our patients.

If it were possible for the everyday dentist to turn over all of the cases requiring orthodontic work to the specialist there is no question that the work would be more thoroughly and quickly accomplished, but at the present time this is out of the question and on account of the lack of knowledge of the subject by the average dentist in the country and in small towns, many thousands of cases urgently in need of attention are neglected.

The indisposition of the average dentist to undertake even the most rudimentary cases of orthodontia is marvelous, and the excuses for not performing a plain duty are often puerile and silly. Lack of time, no knowledge of the work, inability or unwillingness of the patient to pay for the work are among the most common conscience easers. No man should lack time to properly perform his duty and no man should lack knowledge to help him in his work when it is obtainable. The third excuse in many cases is more imaginary than real if the subject is properly presented to the patient.

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* Read before the Virginia State Dental Society, 1910.

Now if we may we will proceed to the practical portion of these remarks.

For the cases which the general practitioner should undertake I would say that the Jackson system, in my judgment, will accomplish better results, and in saying this I do not wish to be understood as disparaging other great systems which have done and are doing so much. I mention the Jackson system on account of the ease with which the appliances can be made and the unlimited possibilities of the operator with the wires when once he has learned their use.

IMPRESSIONS

In order to properly understand the needs of any given case it is positively necessary that good impressions should be taken of the mouth; these should be gotten as accurately as is possible, using preferably what are known as partial impression trays with the composition known as Detroit Modeling Composition. When the impressions of both upper and lower are taken and the models made we are then in a position to determine our line of procedure. We can ascertain from the antagonism of the teeth which teeth we will use for anchorage and what amount of expansion the arch requires to accommodate the malposed teeth. When we have carefully determined what we are to accomplish we are ready to make the cribs, which are the vital parts of the appliance, if one part may be more important than another. After the base wire is laid down on the model, the plaster around the teeth which are to have the cribs should be carefully carved or scraped, in order to compel the crib wire to hug the tooth closely when placed in position in the mouth, otherwise the appliance will not be retained in position firmly enough to accomplish desired work. In addition to the crib, bands may be used with small lugs soldered to them to engage the finger springs or active wires which are to perform the work. In constructing the appliance which is done upon the model and in such a manner that it is not defaced or injured but may be retained as reference as the case progresses, bands are excluded and should be made directly upon the teeth in the mouth. When the appliance is ready for the mouth no pressure should be exerted until after the patient has worn it for three or four days, when gentle pressure may be begun, and in this connection I wish to emphasize the fact that an appliance which is painful to the patient is not only a nuisance but in most cases does harm to the parts and will defeat your object if allowed to continue to annoy and hurt the patient. In order to accomplish the results desired, the work should progress in a physiological manner, steadily, slowly, almost imperceptibly to the patient.

It should be always remembered, however slight an irregularity you may intend to correct, that there are involved in the operation other teeth besides the one we propose to regulate, and that it is not alone a question of securing some appliance to push or pull the tooth into place, but to construct an appliance which will properly regulate the direction of force, so that no injury may result from the procedure.

The proper time to begin the correction of an irregularity is at an early age. This is so well recognized by the specialist in orthodontia that it does not need to be insisted upon, the pliant condition of the parts and the ease with which the teeth may be made to assume the normal condition all tend to overcome any difficulty which may be encountered in handling the young patient. In dealing with the child it is necessary, as in all dental operations, first to secure the confidence of the patient and then to avoid inflicting pain as much as possible. It is also very necessary to secure the co-operation of the patient as well as to have a thorough understanding as to about the time required to perform the operation. Last but not least, when the appliance is put in for the first time, at least half of the fee for the completed work should be exacted. This will help you materially to carry your work to a final issue and give your directions and instructions added weight with the parent.

RECORDS SHOULD BE KEPT

Records of the work can be kept as it progresses from time to time. Tracing should be made of the appliance as it appears before the change is made to increase pressure and by this means one is enabled to note the progress of the work more accurately than in any other way except by taking impressions, which occupies time and increases models to no purpose. These records may be preserved until the final impression is taken in the finished case.

The patient should be instructed to thoroughly cleanse the mouth after eating and to use the brush on the appliance out of the mouth. This can be done without danger of disturbing the active wires or the cribs.

TIME REQUIRED IN ATTENTION TO PATIENT

It will be found after the appliance is put to work in the mouth of your patient that the time required to keep it doing service is very little indeed—even a busy man can take sufficient time during the day to have his patient report for five or ten minutes in order that the tension of the active wires may be slightly increased, for if the construction of the appliance has been thorough, there will very seldom be necessity for any other attention to the appliance.

ACTION OF THE WIRES ON THE TOOTH STRUCTURE

It has been claimed that the use of such metals as are commonly used in making these appliances have a corroding or disintegrating effect upon the enamel and that in many instances much harm has been done to the teeth. I am prepared to accept the truth of the claim where the appliance is a fixed one or where the patient has been careless with the sanitation of the mouth. I can hardly bring myself to believe, however, that harm will be done if the patient will follow instructions and keep the mouth and appliance clean. The object of this paper is not to go into an exhaustive discussion of intricate cases of deformity but to incite in the general practitioner a desire to take up such cases as can easily be handled by him and thus enlarge the sphere of his usefulness in the community.

There are many cases which the average practitioner cannot handle and he should not attempt to do so. If the services of an orthodontist can be secured the patient should be directed to him. In very few cases should the dentist be so unwise as to extract teeth with the idea that in so doing the others will assume an improved position and especially is this true of the superior canines. I will say that these important organs should never be extracted in order to correct an irregularity.

In taking up this work it should first be the duty of the novice to thoroughly master the technique of making the appliance and then to take some of the simplest forms of malposed teeth and learn the laws which govern the movement of the teeth, the direction in which force should be applied and its effect upon the adjoining organs, etc. The technique may be learned from works which are written for the student and much other valuable information may be gotten from the same source. There are many things, however, which must be learned by actual contact with the work upon the patient. I am of the opinion, however, that any intelligent dentist with a reasonable amount of appreciation can perform most of the orthodontic work which he should undertake with pleasure to himself and profit to his patient.

THE CARE OF THE TEETH.*

By H. C. Sexton, D. D. S., Shelbyville, Ind.

IT IS my belief that all men in addition to their business in life have also a certain mission toward their fellow men. The teachers in our schools give instruction not only in the art of two plus two equals four, but they also lead you to an appreciation of the intellectual and the beautiful in life and thereby enlarge the world for you in all directions. The clergyman, besides his business of saving your soul, teaches the value of a good life here on earth; he teaches *moral* cleanliness.

The dentist has a mission also, a mission which it is my pleasure to fulfill here this morning. His mission is the teaching of *oral* cleanliness. So there is only the difference of one letter between the mission of the clergyman and my own—the dropping of an *m*.

Dentistry today is granted the rank of a profession albeit one of the youngest. If we were simply mechanical repairers of the ruin we find in

*A talk before the Shelbyville High School.

many mouths, we would be undeserving of such rank. It is only when we become teachers of oral hygiene that we are most truly a profession. Ordinarily this instruction must be given to an audience of one in our operating rooms, and to get an assembly room like this full to listen to a talk on oral hygiene is a rare opportunity.

I once had an old man say to me as he paid a bill for the filling of his children's teeth, ''There ain't nothin' the matter with my chillun's teeth if they'd just leave 'em alone. They're eternally scrubbin' at 'em and wearin' 'em out.''

At first I thought he was indulging in a bit of humor but he was not. He was really serious. Then I launched forth on a lecture on the care of the teeth. ''Teeth decay,'' said I, ''because they are unclean not because they are clean. When food remains about the teeth it disintegrates—ferments or putrefies according to what class of foodstuff it belongs to—this chemical and bacterial action throws out acids that dissolve the tooth substance. Teeth that are immaculately clean never decay.''

''Shucks!'' exclaimed the old man, ''Jim Jones is sixty year old, never brushed his teeth in his life, got nary a hole in any of 'em and can bite a piece out of a hickory plank.''

''Then Jim Jones' teeth were originally so good that in spite of his uncleanliness they haven't decayed. He is one in a thousand. He is an exception and not an example to follow. Ninety-nine people in one hundred who altogether neglect their teeth will be without a single tooth in their heads years and years before they are sixty, in spite of Jim Jones' record.''

But the old man went away shaking his head unconvinced. He was an illiterate old fellow. All references to chemistry, bacteriology, authorities of any kind were lost on him. His days in school had been few, if any. High school in his young days did not exist. The space in his head that should have been occupied by brain development was filled with the superstition and prejudice of a past age. That poor old man—poor in spite of his big farm—had never learned to think.

His reasoning was something after the style of that classic bit of sophistry given by Montaigue in one of his essays: ''Westphalia ham,'' says Montaigue, ''makes a man drink, drink quenches thirst, therefore Westphalia ham quenches thirst.''

Who can argue with such a man? As you Latin students would say, his reasoning must be taken *cum grano salis*. In fact you must take not a grain but a whole barrel of salt with it.

Today I have a different audience. You have learned to think else you would not be here. You know something of chemistry. You know acids will attack many hard substances. You who have read the story of Cleopatra's drinking her immensely valuable pearl which she had dissolved in vinegar will not be surprised when I tell you that fermentation of wheat bread in the saliva produces lactic acid and lactic acid will dissolve tooth structure just as Cleopatra's vinegar dissolved her pearl.

To the dental profession today caries or decay of the teeth is a solved problem. It was not understood a generation ago, even by our most advanced scientists. Bad teeth were supposed to come from God. It was a vile slander. God sends us no disease. We bring disease upon ourselves by our own ignorance and foolishness. Bad teeth are no exception to this universal law.

When I was a boy I was sure there was such a thing as having one's neck and ears too clean. My mother did not agree with me and thereby hangs many a tale. Possibly your mothers could tell tales also. But be that as it may our necks and ears are none the worse today. No holes have developed in them. But with the teeth it is a different matter. Holes may develop in them. Teeth positively cannot be kept too clean.

In brushing the teeth it would be well to follow the idea advanced by the humorist, Edward Lear, for the making of Crumbobblious cutlets. "Procure some strips of bacon and having cut them into the smallest possible pieces, proceed to cut them still smaller, eight or perhaps nine times."

To have good handsome teeth depends largely upon yourself. We dentists think we can help some, but after all, to indulge in slang, it's up to you. Do not wait until your teeth decay and then have them patched up. Get to work and prevent the decay. You can do it.

Before the war a Virginia colonel was reproached for not repairing his broken-down fences. "Well, suh," drawled the colonel, lazily, "I find, suh, it's much cheaper to station little niggahs at the gaps, suh."

But you haven't even this excuse for letting your teeth go to ruin. If you think it's cheaper just to fill up the gaps you are mistaken. We dentists like to live, and, to divulge a professional secret, we like to live well. Take my word for it, prevention in dentistry as in medicine is both better and cheaper than cure.

"Opportunity," says an old proverb, "has hair in front, but the back of her head is bald; if you seize her by the forelock you may hold her, but if once suffered to pass, not Jupiter himself can ever catch her again."

How true this is of the teeth! Your time to take care of them is now. An hour's cleaning next year will not equal a minute's cleaning this year. Catch her by the forelock for, remember, the back of her head is bald.

We are making much of pure food in these days of laws to protect the people, but how useless it all is to a great big percentage of the mass. How can pure food retain its purity if it must pass through an impure mouth? If we only had and could enforce a law compelling all people to keep their mouths bright and clean, what a revolution it would make. What a lessening of disease would result, for uncleanliness always spells disease.

And, further, food, no matter how pure it may be, cannot benefit you as it should unless it is properly prepared by the teeth and mingled with the saliva. But I am getting onto another subject now—Fletcherism, or physiologic mastication, on which I am a crank, really a crank. So I must come back to the main track or I shall never have done.

In the matter of teeth many people simply allow their mouths to go on from bad to worse. They would be offended should anyone tell them their mouths were unclean, and yet in their hearts they know themselves guilty. They simply allow themselves to float down stream. A dead fish can do that. It takes a live one to swim up. What I want to impress on your minds is this: If you start in time you can make yourself a good set of teeth. Then be a live fish and swim up stream. Don't be merely a dead one and float down.

Besides the usefulness of the care of the teeth there is another consideration—the beautiful. You cannot be considered a cultured person, nor will cultured people care to associate with you unless your mouth has received its due share of attention.

What more attractive than a beautiful set of teeth! That one feature will bespeak more for your character and standing than any other on your face. To have beautiful eyes or a beautiful head and brow is absolutely nothing to your credit. To have a clean, well-polished set of teeth is greatly to your credit and speaks out for you in words of praise whenever you open your lips. Horses are judged by their teeth. It would not be a bad idea to judge people in the same way. We have many standards in this world that are more foolish.

Do you remember the eloquent compliment the Essayist Steele once paid to the Lady Elizabeth Hastings? "To know her," said he, "is a liberal education." What a remarkable statement! Could higher praise be paid anyone? Now, I have never read anything about the Lady Elizabeth's teeth, yet I have an idea what they were else that remark had never been made. They were well-polished, bright, beautiful, such as bespoke then and even more bespeak today the cultured woman. It is impossible they were anything else. My mental picture of them makes me think of that charming quotation from Keats:

"A thing of beauty is a joy forever;
Its loveliness increases; it will never
Pass into nothingness; but still will keep
A bower quiet for us, and a sleep
Full of sweet dreams and health and quiet breathing."

And so you must not think that all your efforts or all your influence are expended on what you do or what you say. What you look bespeaks more for you on short acquaintance than all else. Many a bewitching young woman, many a gentlemanly young man, lose all their witchery, all their credit of being gentlemen when they open their mouths.

In this strenuous age when you see a thing you want, go after it. That is the lesson taught by our Teddy. You must realize that teeth are no exception. Keep your mouth sweet and clean. All Nature wants is a chance. Be a live fish not a dead one. Do not be like the milkman who once went into the cow's pasture with his pail. The cow was on the other side of the pasture. The day was hot. "Perhaps she'll come around here after awhile," he thought, "and then I can milk her without walking over there." So he lay down in the shade and went to sleep. Meanwhile the calf broke through the fence and got the milk. The moral of the story is this: If you want milk go after the cow; don't sit down and wait for the cow to come to you.

And similarly the moral of this talk upon care of the teeth, don't wait for God to pass you another set. He gave you one as a baby but He counted upon a child's living as a child and did not expect you to keep that set. But now, since you have become young men and women—enlightened young men and women—and have put away childish things, He has given you another set that He intends for you to keep, and to keep clean, and to keep by keeping clean.

As you carve your fortune in this world, carve also your dental fortune, and take the word of a dentist of twenty years' practice, dental fortunes are carved—not with a pocketbook, but with a toothbrush, and with a toothbrush alone.

THE FAUCIAL TONSILS AND THE TEETH*

By G. Hudson Makuen, M. D., Chester, Pa.

Professor of Defects of Speech in the Philadelphia Polyclinic Hospital and College for Graduates in Medicine, Laryngologist to the Chester Hospital and Consulting Laryngologist to the Roosevelt Hospital, Philadelphia.

I HAVE given my paper the above title,-not because it is my purpose to say much about the teeth, but because I desire to emphasize the importance of the tonsils from the standpoint of the dentist. Tonsillar disease is so insidious in its origin that in most instances it goes unrecognized until the damage to the neighboring organs and even to the general health of the patient is almost irreparable. The tonsils and the teeth are alike at least in this one respect, and the time to cure either is before the disease begins. In other words, we do not see our patients early enough to give them the best kind of service. The tonsils and the teeth, on the other hand, are very unlike in respect to their physiologic importance to the human economy. No one questions, I suppose, the value of the teeth and the desirability of perfecting and preserving them in all their functional integrity, but the tonsils have fallen into disrepute and they seem scarcely to have justified their right even to existence under any circumstances whatsoever, so that we find some who advocate their wholesale removal whether they are diseased or not. This, however, would seem to be an extremely radical measure for the correction of a great evil. It is too

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*Read in the section of Stomatology (A. M. A.), of which *The Dental Summary* is the representative organ for the dental profession by special arrangement with the JOUR. AMER. MED. ASSO.

much like advocating the hanging of all men because some men are murderers.

The faucial tonsils differ but slightly, either histologically or functionally, from similar glands in other portions of the body, but their general and applied anatomy may be worthy of a brief description.

The faucial tonsils are situated on either side of the oropharynx between the pillars of the palate, and in their normal condition they are scarcely demonstrable without the aid of an instrument to draw them into view. The normal faucial tonsil varies in size, but it is generally not larger than a small almond, which it somewhat resembles in shape. It rests on the fascia of the superior constrictor muscle, which muscle separates it from the large blood vessels and other important structures in the cervical region.

A diseased faucial tonsil is generally more or less hypertrophied in all its parts. It does not necessarily project far into the fauces, but it is often grasped between the pillars of the palate and the triangular fold, or so-called plica triangularis, by means of which it is held down in its bed in the tonsillar fossa. These submerged tonsils are not, as a rule, obstructive, but they are sometimes very large, extending upward and backward even as far as the Eustachian tube, on which they often press, interfering with the air, and blood circulation of the ear, and causing disturbances of its function.

In addition to the triangular fold which partially covers the inner and anterior portions of the tonsil, the gland is enveloped in a fibrous capsule which separates it from the surrounding tissues and lines of crypts, which extend through the entire gland and open upward into the supratonsillar fossa. The drainage, therefore, of these tonsils is extremely faulty, and the result is that the pent-up secretions become foul-smelling and exceedingly irritating, when once they have been discharged into the mouth, to say nothing of the vast numbers of bacteria which are constantly being absorbed into the general system through the lympathics and glands of the neck, causing tuberculosis, rheumatism, scarlet fever and other infections and exanthems.

The function of the normal tonsil is still a subject of discussion. We do not know what it is, but this much we do know, that a diseased tonsil is not only a menace to the general health, but a source of local infection to the oral cavity, harmful alike to the mucous membrane lining this cavity and to the teeth which we are striving so hard to preserve.

Diseased faucial tonsils affect the teeth in three ways. First, they interfere with the general health of the patient and thus with the proper nourishment of the teeth. Second, they contribute very largely to the local invasion of the teeth by the numerous bacteria which emanate from their crypts. And, third, they interfere by pressure with the alignment of the teeth and with the normal development of the maxillary bones.

That the general health is impaired by direct infection from, and through, these glands is a fact which has been proved beyond any possibility of doubt. Dr. George B. Wood has shown, in a series of experiments on hogs, that tubercule bacilli of a virulent nature frequently invade the tonsillar tissues in preference to other portions of the throat, and that even an apparently normal tonsil is unable to filter them out. He and others have also shown that the tonsils and lymphathic glands of the neck combine or form a direct route for the invasion even of the contents of the thoracic cavity, such as the pleura and apices of the lungs. Tuberculous glands of the neck and even pulmonary tuberculosis may therefore be traced directly to disease faucial tonsils; and my own experience has led me to believe that cervical adenitis, whatever may be the specific character of the infection, may, in the great majority of instances, be traced directly either to diseased tonsils or teeth, or to both of these sources combined. Moreover, when we consider the fact that the efferent lymphatics drain into the venous circulation, we have an explanation of the anemia and other symptoms of blood impoverishment which always accompany diseased tonsils and teeth. We have here, therefore, what has been called a "vicious circle." The diseased tonsil, or tooth, transmits its infection through the cervical glands and lymphatics to the circulation, impoverishing the blood which, on its return, fails to nourish the tonsils and teeth properly, and thus disease of these organs is further elaborated and extended.

Furthermore, a diseased faucial tonsil is usually more or less catarrhal in its character and its secretions are often filthy in the extreme. The oropharynx is thus kept more or less bathed in infectious secretions, and the teeth naturally suffer as a result. In a similar way, of course, the normal tonsil may be affected by infectious material from diseased teeth.

The third manner in which the teeth are affected by hypertrophied tonsils is by pressure of the glands on the posterior molars and on the ends of the alveolar arches. So far as I know, this factor in the production of alveolar irregularities has not been referred to in literature, and yet it seems to me to be one of no little importance. These glands are sometimes very large and of firm consistency, and the more or less constant pressure which they exert on the surrounding structures produces marked deformities. I have already referred to the injurious effect of tonsillar pressure on the Eustachian tube, the lumen of which is often so altered as to interfere with the circulation of air in the middle ear, and I need now only to mention, in addition, the marked bowing of the palatal half-arches, the posterior one being crowded backward against the lateral portion of the post pharyngeal wall, interfering with the normal nasal breathing, and the anterior one crowded forward against the molar teeth and their alveolar processes, this latter pressure being alternately increased and diminished by the acts of articulation, mastication and deglutition.

A similar outward bowing of the superior constrictor muscle also takes place, causing pressure, both on the large vessels of the neck, interfering with the blood circulation in all the structures of the head and face, and on the important nerve trunks in this region, causing neuralgias and various trophic changes in the facial and even the cerebral tissues.

The indirect effect of diseased and hypertrophied tonsils on the teeth and their settings, through forced mouth-breathing, has been described fully by numerous observers; and here, by the way, we have another vicious circle. Just where the circle begins is a mooted question, but whether the tonsils cause the mouth-breathing and the resultant dental irregularities or whether the dental irregularities cause the mouth-breathing and the resultant tonsils, should not concern us so much as the fact that it is obligatory on us as dental and oral surgeons to break in on this vicious circle at as many points as possible and promptly destroy its disastrous cumulative effects.

We cannot cure mouth-breathing and its resultant disastrous effects, in all cases merely by the removal of tonsils and adenoids. When there are dental irregularities which make it impossible, difficult or even a little inconvenient to close the mouth, something more than tonsillectomy and adenoidectomy must be done. And likewise we cannot always cure mouth-breathing by making it possible or convenient to close the mouth, but the nasopharyngeal and oropharyngeal cavities must be made free for the passage of the breath currents, else the breathing cannot be normal, nor indeed can the dental arches long remain normal, at least in young children.

My plea in this paper, therefore, is for the eradication of all glandular obstructions to the normal development of the teeth and the alveolar arches prior to any attempt to remedy the structural defects of these organs.

The tonsils, like the teeth, are subject to change and decay. The structural changes of the tonsils are far greater than those of the teeth. Certain portions of them, up to the age of puberty, undergo marked hypertrophy and thus, in some instances, they become very large. In later years, by a process of disintegration or degeneration, it is true, they grow smaller, but except for the ill effects of the pressure, these small and degenerated tonsils, owing to their catarrhal condition, are more harmful than the larger ones, and give rise to more or less trouble during the life of the individual.

It is not good practice, therefore, to wait for the so-called atrophy of large tonsils. An atrophied, like a hypertrophied tonsil, is usually diseased and it bears some resemblance to a diseased tooth, but inasmuch as the tonsil cannot, by any possible means, have its original function restored, what ever that function may have been, the only method of dealing with it is to enucleate or extirpate it. No half-way measures will suffice. I should as soon think of leaving the diseased root of a tooth in the mouth as of taking off only a portion of a diseased tonsil. The modern operation, therefore, is tonsillectomy and not tonsillotomy.

SUMMARY

The faucial tonsils and the teeth are in close approximation and they are alike subject to disease or degeneration.

Diseased tonsils and teeth are locally and systemically unhygienic.

Secretions from the tonsils may infect the teeth, and contrariwise, the tonsils may be infected by the teeth.

Diseased tonsils and teeth are locally and systemically unhygienic, and they become a direct source of infection to the glands of the neck and through the efferent lymphatics to the general respiratory and circulatory system.

Hypertrophied faucial tonsils often become so large as to affect the hearing, the circulation of blood, the nerve supply of the face and head, and the normal development of the alveolar arches.

The teeth serve important purposes, but the exact function of the tonsil has not yet been demonstrated.

The importance of preserving the teeth is fully recognized, but the diseased tonsil is not worth preserving, because it has lost its usefulness and become a menace to the human economy.

The only safe and rational remedy for diseased faucial tonsils is total extirpation.

ABSTRACT OF DISCUSSION

Dr. Frederick Lester Stanton, New York City: Dr. Makuen suggested the possibility of the enlarged faucial tonsil having a direct mechanical effect in pushing the alveolar process and teeth of the lower arch forward of their normal position, and that he has been unable to find anything similar to this theory in the literature of this subject. There has, however, been a similar theory advanced. In order to relieve the pressure on the enlarged faucial tonsil, the child has held the mandible forward, causing the teeth to lock in a malrelation, and in consequence the mandible has been developed to meet the needs of these unbalanced muscular forces, in this way producing a protruding lower jaw.

Dr. Charles K. Teter, Cleveland: I am much interested in this subject, as I have been closely connected with this kind of work for the past six years, but I do not entirely agree as to the necessity of complete extirpation of the tonsil, that is, in the majority of tonsil operations that are done by throat specialists today. I have worked with eight or nine leading specialists, and there are probably four or five who do complete extirpation every time they operate; and the others use their judgment in the matter. I have been in a position to compare the results of these operations, and when it comes to my own children—I have three and two had to have their tonsils removed—I prefer tonsillotomy. One child, 8 years old now, was operated on four years ago and has never had any trouble since. The other, about 4 years of age now, was operated on about a year ago. In children it is necessary to give a general anesthetic, and a tonsillectomy under these circumstances comes near to being a major operation; the hemorrhage is profuse, and it takes some time to do it properly. In an adult it is different, because complete extirpation may be done under a local anesthetic. I have had opportunity to follow up a good many cases, and I find in the majority of cases in which tonsillotomy was performed the after-results are just as good as in tonsillectomy.

Complete extirpation does not always end the trouble. Cicatricial tissue forms, which one of the surgeons states gives him more trouble than leaving part of the tonsil.

I have known in the last year of four cases of hemorrhage in which the patient almost lost his life, and the tonsillar pillars had to be ligated to stop the hemorrhage; so I do not think we should do a tonsillectomy in all these cases. I prefer tonsillotomy in children; in adults, if they have diseased tonsils, I prefer complete extirpation under local anesthesia.

Dr. G. V. I. Brown, Milwaukee: I had the pleasure of seeing Dr. Makuen operate last summer, and I am willing to subscribe to whatever he says with regard to methods of operation in tonsil removal. One point in his paper which I believe to be important has not been touched on in this discussion, that is his reference to tonsils which are enlarged, but not visibly so, because they are buried between and behind the faucial pillars. Recently I was asked to examine a patient who seemed to have rather small, certainly not large, tonsils, and a few minutes later two enormous tonsils were placed in my hands that had been dissected out from under the overlying tissue for the same individual. Undoubtedly, tonsils such as these would cause the conditions Dr. Makuen has called attention to, and unfortunately, if dentists depend on themselves for diagnosis, such conditions would often not be discovered sufficiently early to prevent their leading to some serious results.

Dr. E. A. Bogue, New York City: We all know that children whose tonsils are enlarged will close their teeth in such a way as to promote an irregularity of the dental arches. I happen to possess models of two children taken at different periods of their lives during three or four years, and I think that the progress from almost a normal condition to very great abnormality is evidenced very clearly in those models. It is exceedingly interesting to me to hear Dr. Makuen bring that very point up. I have never heard it alluded to before. I am glad that Dr. Makuen spoke of the vicious circle—bad tonsils and bad arches. This is indeed a vicious circle, and as the proceedings of this section will be read more or less by medical men and by dentists, I think that is an important point which has been pretty much neglected. That the attention of dentists is being more and more directed to the entire oral cavity is unquestioned.

Dr. E. S. Talbot, Chicago: As to the infection of the alveolar process referred to, I do not quite understand just what Dr. Makuen means by the relations of the tonsils to the teeth. There is no question but what there are germs in diseased tonsils, and there are germs in decayed teeth, but how the tonsil can affect the teeth I do not understand. But there is this point in relation to the teeth which I think Dr. Makuen intended to bring out, and that is that in all patients we have more or less interstitial gingivitis, inflammation of the alveolar process and the gums. We cannot have infection of those structures without first an inflammation, then there must be pus germs to infect the part, which would be understood as pyorrhea alveolaris. When the tonsil becomes infected with pus germs we have interstitial gingivitis producing pyorrhea alveolaris, and on treating the tonsil or removing it and afterward curing the pyorrhea alveolaris, it does not occur again, although the interstitial gingivitis may remain. The vicious circle is all important, especially in younger children; the effect on the general system—on the blood and the nervous system is vicious. It prevents growth and development of the jaws and the face and nose as well. We all have seen children develop very rapidly after correction of these conditions.

Dr. G. Hudson Makuen: I had expected that more would be said in the discussion with reference to my note on the effect of hypertrophied tonsils on the alignment of the teeth and the development of the alveolar arches. I have been able to find no reference to this point in the literature, and I should have liked to have had a fuller expression of opinion on it. It should be borne in mind that these large tonsils are sensitive to pressure, as a rule, only when they are acutely diseased, and only a little pressure sometimes is required to determine the position of the teeth and the shape in the alveolar processes. The relation between the faucial tonsils and the cervical glands is a very close one, as has been shown by anatomic dissections, and one observer, after the removal of some cervical glands, actually passed a probe from the wound in the neck into the faucial tonsillar fossa. The other day I removed the tonsils of a small child having a bunch of cervical glands nearly as large as my fist, which almost entirely disappeared in the brief space of one week after the operation. In other cases glandular enlargements in the neck may and do occasionally increase immediately after operations on the tonsils, which fact shows the close relationship existing between these structures.

As to the comparative merits of tonsillectomy and tonsillotomy, I would say that there seems now to be but little discussion. In the recent meetings of the two largest American laryngologic societies, only one man of the three hundred lifted up his voice in favor of the partial removal of the tonsils, and he was one who had long been a practitioner of the speciality, and he was loath to give up his older methods. Only diseased glands, of course, should be removed, and when we have once decided on the operation, I think we should remove all the diseased tissue, and we should not be deterred because the operation is more difficult or because there is likely to be more hemorrhage. With reference to this last objection, I may say that there are those who think the hemorrhage is greater after tonsillotomy than after tonsillectomy, because blood vessels cut through in fibrous tissue do not contract so readily as those not so surrounded. The operation is not a simple one, but requires some skill and dexterity. The removal of only a portion of the tonsil, beyond giving more breathing space, may do more harm than good by making of the diseased stump a more fruitful source of infection.

Dr. Brown's point with reference to submerged tonsils is a good one. The tonsil that protrudes into the pharynx and hangs, as it were, by a pedicle, is probably the least harmful, because it has better drainage and it does not admit of so much absorption of infected material in the general system. In reply to Dr. Talbot, I am of the opinion that foul detritus exuding from diseased tonsils must have a more or less injurious effect on the teeth, and from what he has just said, I gather that he agrees with me thoroughly on this point.

DENTAL LAWS

By Alfonso Irwin, Camden, N. J.

(Continued from page 521 July Summary)

JAPANESE DENTAL LAW

The Japanese dental law contains a clause which reads thus:

"No dentist shall be allowed to make a false advertisement by exaggerating his art, or claim to have a secret method of treatment."

The penalty for violation of this claim is a fine of 300 yen, or $149.40 in United States coin.

Further along, intimation is made that the advertiser may be imprisoned if such offense is persisted in. Then as a fitting climax to the possibilities of punishment to offenders there is added *Revocation* of the *License* and disenfranchisement.

The Japanese dentist's field of operation is limited to his own district, and if he is caught invading the territory of a brother dentist, he is liable to a fine, or imprisonment, or both. The penalty of imprisonment again carries with it the disenfranchisement liability.

This paragraph throws out a hint of what might yet become a necessity with the oncoming years, in our own country, when you consider the migratory dentist who visits our health resorts in season, the invasion of the dental specialist, or consultant, in states where he does not possess a license to practice dentistry, and the liberties taken by some clinicians.

RE-REGISTRATION

When we speak of re-registration, we refer to the annual filling out of a blank prepared for that purpose containing the name and address and credentials of the dentist, and returning the same to the Secretary of the

State Board of Dental Examiners by a fixed date. There is no fine attached for failure to comply with this requirement in some laws. There should be some penalty attached in order to make it effective. Some states revoke the license. Others charge from one dollar up per year for a renewal. Montana charges four dollars, Colorado and Michigan charge twenty-five dollars for the renewal certificate, and so on, but the majority of the state laws omit such a provision.

LICENSE RENEWAL

There will come a time in the history of this country, when the issuance of a license to practice dentistry, will only be good for one year, and will be contingent upon the annual registration of each dentist (accompanied by an annual registration fee). The new dental law of Wisconsin requires an annual registration, in order to continue the license in force. We recommend the following excerpt:

Part of Section 2—"And said board shall have power to revoke the license of any person who has failed or may hereafter fail, to annually register as herein provided, if for ninety days after notice in writing from said board of such neglect, such person shall fail to so register."

RE-REGISTRATION FEE

An annual registration fee of one dollar is not unreasonable, and it would serve as a nucleus for a legal fund to defray the expenses of prosecuting illegal practitioners of dentistry. We believe that a fee of one dollar each year should be collected for such a purpose, and all dental laws should contain a clause requiring annual registration with the Secretary of the Board of Dental Examiners by a specified date.

This enables the authorities to keep a complete and correct record of the names and addresses of the legally qualified dentists of the state; it also facilitates the work of prosecution of the illegal practitioners of dentistry; *otherwise*, it is impossible to keep track of *illegal* practitioners.

RECIPROCITY

There should be incorporated in every dental law a clause to this effect; an applicant shall be granted a license to practice dentistry in the state for which the application is made, provided he possesses a license to practice dentistry from the Board of Dental Examiners located in the state wherein he has resided, at least five years, at the time of making such application, obtained after passing an examination before the aforesaid Board, requiring an equal standard of preliminary education.

Also practical and theoretical tests of fitness to practice commensurate with the requirements of their own Board, the Board of Examiners receiving such application, being the sole judge of the aforesaid equality of standards maintained by each state, and providing the first-named state

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Note.—We have not been able to find any clause referring specifically to Registration by the Auditor, County Clerk, Prothonatory, Secretary of State, or Board of Health, in the Dental Laws of West Virginia, Massachusetts, New Hampshire, Rhode Island, outside of the general requirements of registration with the State Board.

interchanges licenses upon the same basis. *Reciprocity* is the *constitutional remedy* for *Federalism* in *Dentistry.* Nineteen Boards of Dental Examiners in the United States now interchange licenses upon a basis similar to the one embraced in this clause; two non-interchanging states favor such a clause and are endeavoring to secure legislation to that effect; twenty-seven Boards in the United States do not interchange, and three Boards have declined to commit themselves on this point. These figures indicate solution of a vexatious interstate problem. We predict that in time reciprocity will become world-wide. It will form a basis for international dental equity. Reciprocity will supplant *federalism* in this country. *Reciprocity* is meting out *dental justice to all states, nations and individuals.*

DENTAL COLLEGES

We are convinced that the law has been working on the wrong end of the proposition, to rid the state of illegal practitioners of dentistry. It should deal with the source, the fountain head of the stream of offenders pouring through the states.

Just see what trouble, what expense, what time, energy, hard feeling, what disappointment would be saved, if the law should provide something to this effect: "Any dental college admitting as a matriculate any student who fails in the "entrance requirements" as published in the catalog of the aforementioned college, shall be subject to a fine of one thousand dollars for each and every offense.

"Any college conferring a dental degree upon a student who has not complied with the curriculum of the college and measured up to the

NOTE—In New Jersey, we have had eight cases in court at a time, in various stages of legal process, for violating the law. You doubtless have many more and the larger states of the Union have a number in proportion to their size and population, wealth, or spirit of litigation.

NOTE.—Our State Prosecutor, Dr. Chas. A. Meeker, informed me that the largest number of cases in court at one time was last year when we had two cases in Police Courts and held for Grand Jury in New Brunswick, two in Paterson, two in Newark, two in Jersey City.

In Newark the Judge would not hold them for the Grand Jury (evidence not corrobative); in Paterson the Grand Jury would not indict. In Jersey City both men were held for trial indicted by the Grand Jury and one had his trial as you know, Dr. Saxemeyer.

The other case of King in Jersey City the Grand Jury found an indictment against him, but he was not held for trial on his promise to leave the state and never return to practice dentistry and he has done that, went to Pennsylvania. One man in Paterson became frightened and skipped before the Grand Jury met, after he was arrested; the other one has since left the state.

The New Brunswick cases were held by the Police Court for the Grand Jury, but the Grand Jury would not indict, several of the jurors said they didn't think either of the parties were doing any harm and they are both continuing their work. Their cases will be brought before another Grand Jury at a future date. This is the second attempt to have the parties indicted by the Grand Jury, and a failure, both times. We are after cases all the time, but in many of them, as soon as my assistant interviews them, they close up and get out. Most of them think they would stand no show in court, as she always informs them she has all the evidence necessary, and in some cases finds them operating herself, when, of coure, they are caught with the goods on them.

standard of the aforementioned college as published in their annual catalog, whether in attendance upon lectures and quizzes, or college examinations, and other qualifications of study or work, shall be subject to a fine of one thousand dollars for each and every offense.

"Any college which persists in violating any one, or both, of these provisions for three consecutive years, shall have its charter annulled and its doors closed."

(To be Continued)

TREATMENT OF INFLAMED PULPS

By A. D. Kyner, Moweagua, Ill.

The following method is practically a specific for aching pulps in deciduous molars. The cavity is cleaned and the pulp exposed, if possible, although this is not essential. Owing to the irritating properties of Nervocidin, it is necessary to combine it with an analgesic. Dr. Soderberg recommended cocain, but owing to its transient effect, the application becomes painful. After using several different drugs in combination with Nervocidin, thymol was selected, as possessing not only analgesic but strong antiseptic properties. The application is made in the following way: On a small pledget of moist cotton, take up a quantity of Nervocidin about one-half the size of a pin head, and apply near the exposure, if there is one. Over this flow a thick paste of thymol in chloroform and cover with a disk of blotting paper to fit floor of the cavity. The best sealing for this case is a loose pledget of cotton soaked with the despised sandarac varnish to fill about one-half of the cavity. This is condensed with a wet pledget of cotton. Complete the dressing with a temporary stopping. In making the application of Nervocidin, do not allow it to touch the pliers, as it becomes very sticky when moist. Being very soluble in water, it is difficult to seal, and in deciduous teeth, rather than resort to cement which is hard to remove, and temporary stopping which is difficult to place without pressure, the above dressing will be found to answer; it will not leak, can be applied without pressure, and is readily removable. Allowed to remain from forty-eight to seventy-two hours, the first case is yet to be met with where anesthesia was not complete and the removal of the pulp painless. And it has been observed that this application causes little or no pain, its irritating effects are practically *nil* in children's teeth. When this application remains in teeth from forty-eight to seventy-two hours, the teeth become sore, but many teeth, both deciduous and permanent, having been examined after these applications and fillings are completed, show no symptoms of tenderness. Several deciduous cases failed to return until two or three weeks after treatment; the pulps in these teeth were dead, having the appearance of arsenical pulps, and in one case an abscess formed. Eugenol had been used with the Nervocidin as the analgesic agent, and as it possesses little or no antiseptic or germicidal power, the necrotic pulp was not rendered sterile.—*Dental Review.*

EDITORIAL

VACATION TIME

A VACATION or not, that is the question confronting many a dentist at the present time. Whether it is better to leave the office and sacrifice the dollars he could earn during the few weeks, or stay at home and earn the dollars and at the same time save the expense of an outing.

If dollars is the thing to be considered we would say, stay at home; work as hard as you can during the exhausting hot weather, never mind the effects on your nerves or disposition so long as you are earning the dollars. Keep at work day after day; year in and year out; never take a rest. If it shortens your life, never mind, for some one else can spend the money you are accumulating. Often we hear some one remark that he does not need a vacation; that he has been in his office every day for so many years, etc., as though it were a crime to be out of the office a single day.

We believe such dentists are making a mistake. The occupation of the dentist is different from that of the physician or other professional man. The physician has short office hours. His practice takes him out of doors the greater part of the day. But not so with the dentist. He is shut up in his office all day long; the greater part of the time, perhaps, standing at the chair, maybe in a cramped, unnatural attitude, and often in a position to breathe the exhaled breath of the patient. And as a rule he takes but little exercise after leaving his office for the day. Such humdrum work is wearing on the physical body, which needs a change of occupation or a rest. A man must have a certain amount of relaxation. For man's physical good we have one day in seven for rest, but there are many dentists who do not observe it. The busy dentist needs even more than this. The nature of his work calls for an occasional change of environment. It may be golf, horseback riding, autoing, hunting, fishing or some other kind of outing. All are beneficial to a tired body, but each man must determine for himself what form of recreation he will enjoy most and how much to keep the physical forces in the best working order, that he may give patients his best service at all times.

OBITUARY

JOHN QUINCY BYRAM.

JOHN QUINCY BYRAM was born at Paragon, Ind., June 1st, 1871. When he was 19 years of age he went to the state of Washington, where he served for three years as assistant in the dental office of Dr. L. E. Ervin, of Seattle, Wash.

In 1893 he came to Indianapolis and took up the study of his chosen profession at the Indiana Dental College, where he graduated with honors in 1896. During his three years' course in dentistry he maintained a dental office in Irvington, a suburb of Indianapolis, practicing by license of a permit granted by the State Board of Dental Examiners. After his graduation he retained his practice in Irvington until the fall of 1898.

JOHN QUINCY BYRAM

In 1896 he accepted a position in the Indiana Dental College as clinical instructor in the infirmary.

In the fall of 1898 he gave up his practice in Irvington to devote his entire time to teaching at the Indiana Dental College. His first chair with the faculty was that of Prosthetic Dentistry. In 1901 he took the chair of Crown and Bridge Work. In 1902 he began his self-prepared course on instruction on Porcelain Work. In the meantime he had charge of all the teaching of Prosthetic Technic from 1896 to 1908. From 1908 until his death he taught Advanced Technic, Prosthetic Dentistry, Crown and Bridge Work, Porcelain Work, and was clinical instructor at the College.

The first of August, 1908, Dr. Byram entered into the active practice of dentistry in the Willoughby Building, associated with Doctors H. R. McKinstray, Arthur Guedel and Carl D. Lucas.

In 1906 he served as President of the Indiana Dental Association, and in 1911 as President of the Institute of Dental Pedagogics, at the Washington, D. C., meeting.

He was an active and enthusiastic member of the Delta Sigma Delta Fraternity and was elected Supreme Worthy Master of the Fraternity at its Denver meeting in 1910, having served four years as treasurer of the Fraternity.

In 1907 he published a book entitled, "The Art of Filling Teeth With Porcelain," which work has proven him to be authority in this line of dental surgery.

His services as lecturer and clinical demonstrator were very much in demand and for the past eight years he has lectured upon and demonstrated scientific dental operations before dental associations within nearly every state in the United States. To do this meant incessant labor and much thought. He was never known to shirk a duty, no matter how large nor how small, unselfish in all dealings with his professional brothers and every one with whom he came in contact.

On account of overwork his health had rapidly been failing for the past two years and although he had tried hard to pull himself together. he felt it impossible for him ever to recover.

On the night of June 28, 1911, in a moment of mental aberration, he took his own life in his private office. He left a note as follows: "My nerves are gone, I have tried hard for two years to get well and I find I am getting worse every day. If this keeps up I will be unfit for anything. I cannot stand up under this strain any longer."

His widow, Bertha C., a son, John Quincy, Jr., a daughter, Mary Anna, of Indianapolis, his mother, Anna, and sister, Anna D., of Irvington, and his brother, P. M. Byram, of Camden, Arkansas, survive him.

He was buried in Crown Hill Cemetery, Indianapolis, Indiana, July 1, 1911.

—C. D. L.

Dr. Morton H. Evans

Dr. M. H. Evans died at Toledo, 3:30 A. M. July 4, 1911, of Ludwig's Angina, after an illness of about two weeks, following an operation for hernia.

Dr. Evans was born in Franklin, Ohio, in 1859. He was a graduate of the High Schools of Franklin and studied and practiced pharmacy for a number of years. In 1886 he entered the Ohio Dental College at Cincinnati, as a student of dentistry, graduating in March of the year 1888. After graduating he practiced dentistry for six years at his old home in Franklin.

On New Year's day, 1895, he came to Toledo and entered into partnership with Dr. H. E. Harlan, who was an old friend and classmate. This business relation existed uninterrupted up to the time of his death. He was unmarried and made his home at the Monticello.

Dr. Evans was a gentleman of a singularly mild and gentle disposition. He immediately became a dentist of prominence in Toledo and had a large clientele of devoted and admiring patients.

It can be truly stated that he left a reputation for fair dealing and good service that might be envied by the highest in the land.

THE DENTAL SUMMARY

The Magazine That Helps

Vol. XXXI SEPTEMBER, 1911 No. 9

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The Indiana State Dental Society
The Kentucky State Dental Society
The Louisiana State Dental Society
The West Virginia State Dental Society
The Northern Ohio Dental Society
The Northern Indiana Dental Association
The Eastern Indiana Dental Society
The Southwestern Michigan Dental Society
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REGULAR CONTRIBUTIONS

REPAIR OF CEMENTUM (ANENT THE TREATMENT OF ALVEOLITIS.)*

(President's Address.)

By M. H. Fletcher, D. D. S., M. D., M. S., Cincinnati, Ohio.

MANY YEARS ago Dr. Wm. H. Atkinson, of New York, endeavored to induce repair in the sockets of teeth which were deeply affected with alveolitis, by sponge-grafting, a method of surgery then in vogue.

At that time, from 1885 to 1890, the discussion of the etiology and treatment for the diseases of the sockets and gums was at a very high pitch, the name Pyorrhea Alveolaris being then, as it is now, strongly objected to by many as inadequate and misleading. The writer prefers the name Alveolitis since it in every way seems most suitable. The etiology and pathology of the disease and whether it be local or constitutional, were also hotly discussed. Since those days, however, the methods of treatment have changed very little, excepting possibly in thoroughness of cleansing roots and sockets.

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*Read before the Ohio State Dental Society, 1910.

If, however, we knew all the causes and the actual tissues most involved in the repair, we should know better how to treat the disease intelligently, and have a greater number and more complete recoveries. It is hoped the facts here to be presented may do something toward this end.

The wonderful recuperative power of the cementum has recently been brought to my attention with great force and has resulted in a quite active research regarding this tissue. Such literature as I have been able to find about cementum and its relation to human teeth, with one exception, contents itself in mere descriptions of its locality and histology, but not of its necessities and uses.

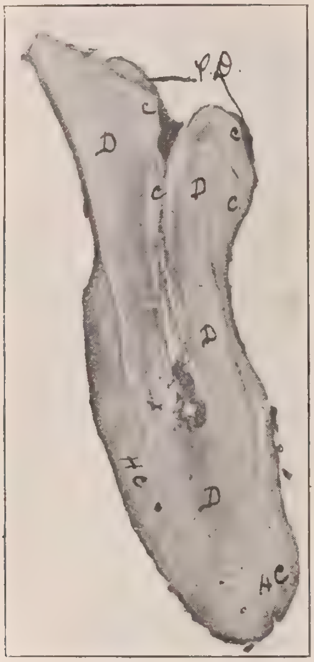

Fig. 1

Fig. 1.—Section of the decalcified tooth X-6½, showing D, Dentin; C, Cementum growing onto broken surfaces of dentin and down into root canal. H. C., Hypertrophied Cementum; P. D., Peridental Membrane on newly formed cementum.

Cementum is the bond of union between the teeth and bone and seems much like bone in its recuperative and reparative powers. For one to know that under proper environment the cementum will reform, when it has been removed from a root or cut into grooves, should be a fact of much moment and value to those interested in the treatment of diseases of the sockets and the surrounding tissues.

The incident which encourages me to believe that such repair will take place is as follows: A year or more ago a young lady of nineteen presented for treatment. Some four years previous she had lost the crown of the first lower molar on the right, by an attempt to have the tooth extracted. The crown had been broken at an angle quite below the neck, so that the soft tissues, when they began to repair, lapped part way over the broken surface. On close examination the soft tissues were found to be quite adherent to the broken surface of dentin. This being very unusual the roots were carefully extracted, the lump of soft tissue still adhering to the broken surface. The anterior root was decalcified with some of the soft tissue still adherent. Sections were made from the root and adherent tissue and are here presented for your inspection. (See Fig. 1.) It was found that the cementum had not only grown over and become adherent to the broken surface of the dentin, but had partly filled the canal of one root from the top down, something after the manner of the growth of secondary dentin induced by abrasion from mastication. (See Figs. 2 and 3.) The formative membrane is still adherent to these surfaces as shown in the sections. The cementum on the root is very much thicker than is normal in

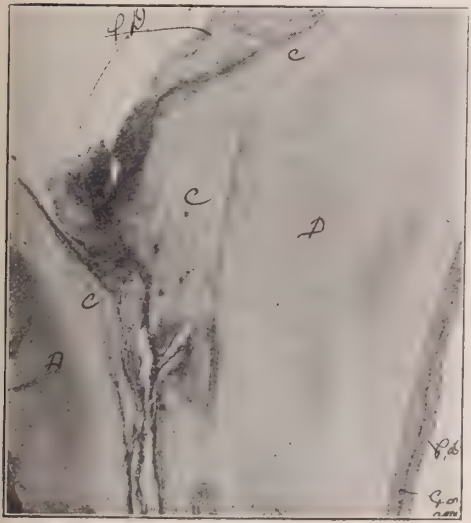

Fig. 2

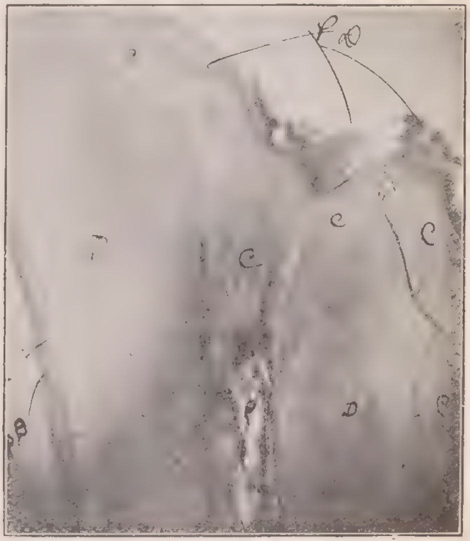

Fig. 3

Fig. 2.—Section of the decalcified tooth, X-75. D, Dentin; C, Cementum filling in the pulp chamber and root canal. P. D., Peridental membrane adhering to the surface of the newly-formed cementum, where the latter has formed on the broken surface of dentin.

Fig. 3.—Section of the decalcified root X-60. D, Dentin; P, Pulp; C, Cementum filling in the pulp chamber and root canal and growing upon the broken surface of dentin; P. D., Peridental membrane adhering to the surface of the newly formed dentin, where the latter has formed upon the broken surface of dentin.

teeth of this age. (See Figs. 1 and 4.) This no doubt is due to the disturbance brought about by the attempt to extract the tooth.

Nodules of cementum on the roots of teeth are very common in older persons and are called exostoses (see Fig. 5), but to find cementum formed and adherent to a broken surface of ivory of a human tooth, much as it is upon the roots, is a new factor in biology to me, and is of so much moment to those interested in the treatment of alveolitis that I have spent much time in investigating the subject.

The specimens here presented seem to show that if environment is made perfect in treating deep-seated cases of alveolitis we may have a normal restoration of tissue to a great extent if not to the full amount. In the language of the general surgeon, we can expect to have a healthy useful stump if we cannot have a complete restoration.

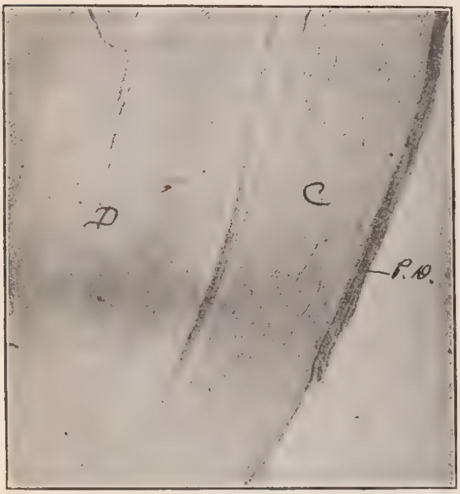

Fig. 4

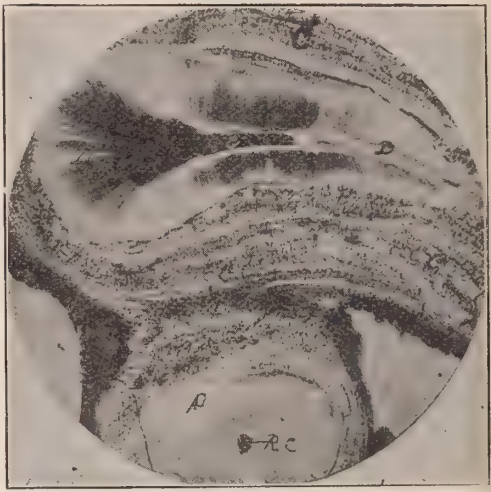

Fig. 5

Fig. 4.—Section of root of the decalcified tooth X-100. D, Dentin; P. D., peridental membrane; C, Cementum, very much thickened from attempt to extract the tooth.

Fig. 5.—Cross section through roots of superior first molar. X-14 diameter. D, Dentin; C, Cementum; C2, shows where the new growth of cementum has cemented the roots solid together; R. C., Root canals.

Continued search in the literature on cementum resulted in finding that Dr. G. V. Black had observed the following, which is corroborative of what is here presented; he says:

"An absorption of any portion of a tooth, dentin or cementum, if repaired at all, is repaired with cementum; no matter how deeply it may have been cut into the dentin, it is never repaired by dentin. Many of these repairs are found in the study of histology of the teeth, where, for some cause, as absorption has occurred, cutting deeply, perhaps, into the root of the tooth. Several pictures showing this are published in my book on *Periosteum and Peridental Membrane.* The Photomicrograph, Figure 155 (see Fig. 6), shows the repair of an absorption which has occurred in the root of a tooth in which the full contour is rebuilt with cementum.''

We all know numbers of cases where teeth have seemed hopelessly loose while under treatment, which have in time become firm and useful for many years, and I for one have wished many times that we might know just what the process of repair was. Finding this one case of excessive growth and unusual attachment of the cementum to the broken surface of dentin, teaches one what it can be, and I am now convinced that it is the cementum upon which we largely rely for the repair in these cases, it being the underlying factor of attachment and repair. This is corroborated by Dr. Black's cases.

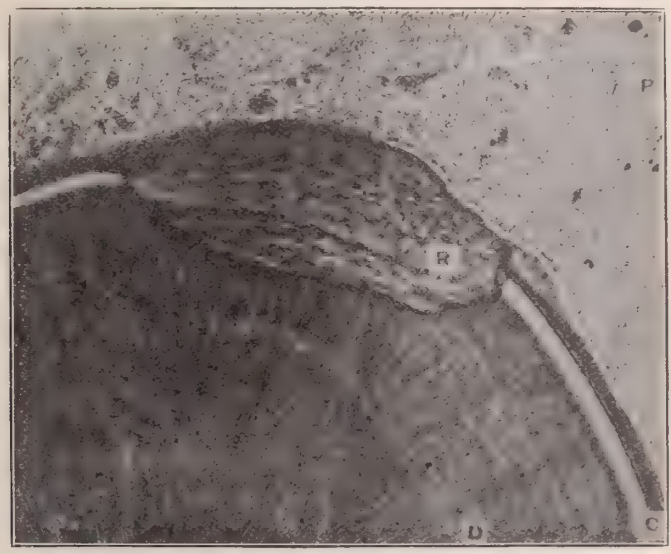

Fig. 6

Fig. 6.—A photomicrograph of a portion of the root and peridental membrane of a tooth in which an absorption has been repaired by a new growth of cementum; D, Dentin; C, Cementum; P, Peridental membrane; R, new Cementum built in, in repair of an injury by absorption.

Other specimens to be presented show excessive growth of cementum which must have been the result of some stimulating environment.

Cementum is of mesoblastic origin like dentin and bone, but bone seems one step too far away from dentin in physical character for perfect union between them. In the growth of teeth in vertebrate animals the cementum seems to have been a development to supply the intermediate link as a bond of union between tooth and bone.

Cementum is the natural product of the pericemental layer of the periosteum of the socket. Cementum is formed when the periosteum comes in contact with dentin but does not exist until the dentin of the root of the tooth is formed. The presence of the dentin of the root in proximity to the periosteum seems to stimulate into action the layer of cells next to the dentin, bringing into action that unknown law, the differentiation of cells, and cementum is the result. Thus it is seen that the periosteum of the socket is a most remarkable tissue, in that it forms bone on one side and cementum on the other and at the same time acts as a cushion against the forces of mastication. (See Fig. 7.)

A translucent layer of cementum is said to form on the enamel and about the necks of the teeth, but in this locality it has no structural characteristics.

Now since we know by the specimens here presented and by Dr. Black's statements that this membrane is capable of what seems unusual things, we can set our goal at having nature reproduce much of the lost attachment in diseased sockets. The necessary conditions to produce this result would mean that we must have live tissue to live tissue as is done in setting a broken bone. Sterile bloodclot must fill the space between. In order to produce this condition the roots of the teeth must be surgically free from foreign matter. This can be done by scraping and polishing, or by planing the roots off with instruments like Thompkin's, Hartzell's or Carr's sets; this leaves live tissue on the tooth side. Now remove all dead or diseased bone or other tissue from the socket (the writer has devised bone curettes and engine burs for this purpose), this leaves live bone

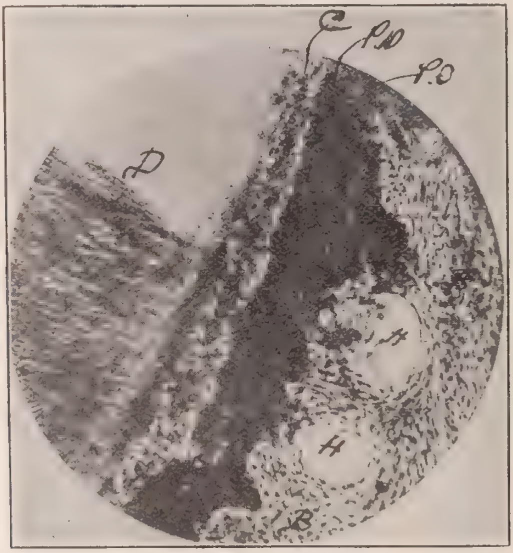

Fig. 7

Fig. 7.—Section of goat's jaw tissues in situ, X-50. D, Dentin; C, Cementum; P. O., Periosteum; P. D., Peridental membrane; H, Haversian canals; B, Bone.

tissue on the other side opposing live dentin or cementum. Now, if the wound be kept sterile by gently washing away the disorganized bloodclot at proper times we would have what would seem perfect conditions for repair, the space not being large enough to demand anything like sponge-grafting, the bloodclot serving the purpose better in so small a wound.

This condition no doubt existed in the case of repair here presented, that is, a broken surface of live dentin on one side and healthy cementum producing tissue on the other side, in close proximity, so that it could grow over the broken surface of dentin with the results shown. (See Fig. 8.) The cementum producing membrane may come from above or below in socket diseases, or from both directions.

If pus is found forming again, as it often is where the pyorrheal stage exists, either more thorough curetting should be done, or escharotic germicides used, such as pure lactic acid, tincture of iodine, or the Dr. Joseph Head solvent. The writer has best results with tincture of iodine in most cases. This is used following the cleaning and curetting, also in subsequent treatments. Tincture of iodine is a strong germicide penetrating deeply into the bone. These irritants are not only used as a germicide but as an escharotic to keep nature throwing the strongest possible army of repair into the neighborhood. She will thus renew her effort as often as called upon, if fresh wounds are made in the socket at suitable intervals. Setons were formerly drawn daily through wounds for this purpose, but daily disturbance is too often in these cases. A few days or a week apart is frequent enough. Care should be taken that this treatment falls short of de-

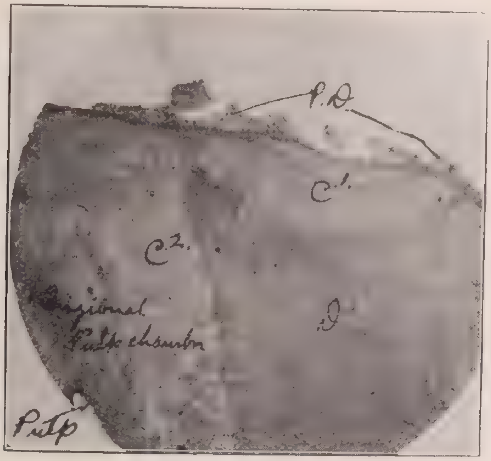

Fig. 8

Fig. 8.—Section of the decalcified tooth X-150. D, Dentin; C1, Cementum growing onto broken surface of dentin, not fractured away from dentin by mounting; C2, Cementum filling in the pulp chamber; P. D, Peridental membrane adhering to the newly-formed cementum.

stroying any repair in the form of organized bloodclot or new tissue which has already been established.

If the tissues are put and kept in normal condition for repair as above described, healing of the bone and cementum will take place in due time, that is in from two to four months, or in whatever length of time it would naturally take such wounds to heal, possibly a year or more in some cases. Flesh, of course, heals in much shorter time than cartilage, bone or cementum. But it is up to the doctor to know when the tissues are in proper condition for repair, to know how to produce these conditions and keep them thus until repair is complete.

My conception of the conditions under discussion is, that aside from the initial lesion of the gums at the inception of the disease, that the diseased bone is the cause of the soft tissues being inflamed and that when the bone is well the gums will be well. If I am wrong in this matter I wish to be set right and to that end I herewith challenge discussion of the laws of physiology and pathology that I may not continue to advocate an untruth.

It should be remembered that in only a few cases of the disease are the tissues likely to be reproduced to their original height about the necks, but that what remains can be put and kept in a perfectly healthy condition.

It seems to me that we now proceed in the treatment of alveolitis without any definite idea of what processes are called into play in the healing, but we go ahead and do something and if the case recovers, well and good, if not, we do not know why nor do we know what we should do to induce nature to make the repair, yet this is the thing she is always trying to do and always will do if the doctor is bright enough to know how to remove the hindrance in her way. Thus encouraged, nature will accomplish what may seem wonders but what to her is following natural laws.

The facts as displayed in this case of repair are certainly a definite and encouraging goal for us, and I believe the proper one; that is, we may look forward to the activity and reproductive power of cementum to form a new bond of union, knowing it will thus occur if environment is made right.

In bone surgery it is not thought the periosteum reproduces itself by growing edgewise to any great extent, but surgically speaking the reformation of enough periosteum and pericementum to line the whole tooth socket would not be considered a large amount to be reproduced. As a rule the conditions about the necks of alveolitis teeth are such that new tissue cannot be reproduced to its original amount but, as stated, what remains can be put into a perfect state of health.

Often arteriosclerosis, autointoxication or other systemic disorders hinder the healing of these wounds the same as they hinder the healing of wounds in other parts of the body. If these conditions exist they should be looked after either by the operator or the family physician, since the condition of the blood and blood vessels have much to do with the susceptibility of patients to alveolitis as well as their susceptibility to other diseases, such conditions also have much to do with the tendency of tissues to repair or to remain chronically diseased. So the systemic disorders must be looked after as well as those that are local.

Many cases of necrotic and suppurative alveolitis are reported to have gotten well by systemic treatment, but this is always after the deposits have been removed from the roots, which I believe to be the main factor. From my viewpoint these cases recover, if from systemic treatment, on the same principle that tubercular and other diseases get well, that is, by the patient's health being so much improved through medical or climatic assistance that the system is equipped with sufficient additional material and vigor to overbalance and finally overcome the disease, the thing she is always trying to accomplish.

The writer gave an extended paper on his conception of alveolitis, its causes and treatment, before the *Tri-State Dental Meeting* at Indianapolis, in June, 1908. Any one desiring will find this paper published in the *Journal of the American Medical Association,* issue of December 19, 1908, and in THE DENTAL SUMMARY of January, February, March and April of 1909.

In that paper I made the statement that "experience shows that scratches and grooves on the roots from instruments are nearly always present, although this should not be. These scratches, when under the margin of the gums, do not cause the roots to decay nor prevent the tissues from being healthy."

In the light of the case herein reported and the Dr. Black statements, it would seem that the laws of repair are such that the mechanical treatment should be persisted in until every particle of calcareous deposit is removed, the smallest bit remaining being an irritant and a hindrance to complete repair, the "scratches and grooves" being no hindrance.

Dr. T. B. Hartzell claims that it is better or necessary to plane off or remove the surfaces of such roots as have been exposed, since he believes such surfaces are infected and when not taken away they serve to perpetuate the disease.

Considering the laws of repair, in connection with facts herein set forth, it seems to be true that nature will undoubtedly repair these cases if we but give her the proper opportunity.

DISCUSSION.

C. M. WRIGHT, Cincinnati: Before saying a word on the subject proper of the excellent paper which we have listened to today, I want to compliment Dr. Fletcher on his selection of the term *Alveolitis* for the disease of the sockets of the teeth, which the dental profession all over the world has fallen into the unfortunate habit of calling "Pyorrhea."

Six years before Dr. Fletcher read his paper entitled "Alveolitis" in Indianapolis at a meeting of the Tri-State Dental Society, I had read a paper on the same disease, from the same platform and before the same society, and in order that I should not in any way help to confirm the use of the popular, though inexact and unscientific misnomer

''Pyorrhea,'' I headed my paper simply ''Inflammation of the Sockets of the Teeth.'' I never thought of employing one single comprehensive word like *Alveolitis,* and I want to publicly express my congratulations to Dr. Fletcher for his adoption and employment of this term. A study of inflammation of the sockets of the teeth, or alveolitis, must include a careful consideration of each and every tissue which is found in the socket, the bone tissue, forming the walls of the osseous socket, the cementum attached to the tooth root, the pericemental and periosteal membrane, the mucous and submucous membrane forming the gum, with the glands and blood vessels and nerves of the gum and possibly the dentin of the roots, to which the cementum is so closely attached, mechanically and vitally. A broad conception of the several phases of the classic term inflammation, with its rubor, tumor, calor and dolor, and our later pathological conception of the intimate changes in the circulation of the blood and lymph, and in the vessels themselves in the immediate locality of an injury, makes the redness, the swelling, the heat and the pain not simply naked eye symptoms, but microscopic revelations of minute changes in the aspect of every cell and fibre of every tissue involved. Inflammation, while treated as a disease, is essentially, to the eye of the microscope, a living moving picture of each tissue in its reaction against some irritant. Tissues react in various ways, each after its own kind, depending upon its individual morphology and physiology. Bone, cartilage and fibres of the connective tissue group present variations. Muscle, nerve, blood and lymph vessels show peculiarities in their reactions, especially in the regenerative part of the exhibition. Every tissue cell, differentiated to perform its functional specialty, has its own method of defense against its enemies—against mechanical, chemical and bacterial irritants and against plasmic influences. By plasmic influences I mean those which operate through the blood and lymph, the fluids which continually bathe every live cell in the body. The composition of the lymph is determined by the composition of the most complex fluid in nature viz., *the blood plasma.*

Blood plasma contains an endless variety of substances, food stuffs, oxygen, carbonic acid, ferments, waste products, opsonins, toxins and other bodies, many of which defy the most careful and delicate methods of chemical research. This complex fluid, it must ever be remembered, forms the constant environment of every living cell and tissue of the body. It is the ever-present plasmic environment of nerve cells, muscle cells, bone cells, tooth cells, and it is good or bad for the cells, according to its composition. Think of it, every living, deeply hidden odontoblast, and every cell embedded in the cementum depends for its life and health and energy on the plasma of the blood, and the pathologist has come to believe that the plasma is chiefly responsible for whatever disease may affect the cell. Morbid plasma may set up acute destructive changes in special kinds of cells. It would be impossible to trace the various degenerative changes which may be produced in the tissues bathed by morbid plasma.

In the disease alveolitis we have this and many other things to consider.

When we study the phase of regeneration, or the repair of tissues, we must not forget that the different injured tissues pursue different routes on their way towards perfect regeneration, although in the beginning of the process, the blood and the connective tissue cells play the chief role in this high class variety show of the forces of protoplasm. The prominent function or business of the cells of the connective tissue group is to make intercellular substance. Some of these cells take from the lymph in which they are constantly soaked, not only food stuff to supply and build up their own bodies, but the substances that will supply their energy with material for building outside of themselves, and permit them to deposit lime salts, chondrin, elastin, etc., for the structure of the different kinds of intercellular substances, such as bone, cartilage and the various fibres laid out in nets, in strings and in bundles as we find them in the adult varieties of intercellular fibrous connective tissues. We know that if every other tissue, nervous, muscular, epithelial and vascular, could by some process be entirely removed or dissolved and washed away from a complex creature, and only the connective group be left uninjured that we would have a perfectly formed, honeycombed being with every gland, blood vessel, muscle and nerve beautifully outlined. I have often tried to picture to my mind a mouse or a man placed in a jar of some fluid which would eat out every part of the substance of the body and have no effect upon the connective tissue, this active living framework, from the skeleton bones to the basement membrane of the epidermis. What a study this would make and what lessons it would afford to the morphologist and to the student of methods of repair and regeneration of impaired tissues. It is the peculiar and special function of the cells of this connective tissue to build the scaffolding of the body. In our studies of repair and regeneration of tissues in the living body we find first an increased activity in these scaffold builders. Their method is to construct granulation tissue from which, by successive, well observed steps, we find scar tissue evolved—as a kind of half-way station on the road toward complete restoration. A cut through a muscle is repaired, first by scar tissue; through bone, by scar tissue; through a gland (like the liver, for instance), through scar tissue, and this is accomplished by living connective tissue cells, or more exactly by the fixed and wandering cells of neighboring connective tissue, by endothelial cells and by the leucocytes which have escaped from the blood and lymph vessels, forming granulations, budding blood vessels, and then in the waking up of the special function, fibres are laid between the cells and we have a foundation or scaffold for later complete reformation of the original tissue. This perfect regeneration may require years of time in some tissues and locations. Atkinson's employment of the sponge was an attempt to help this connective tissue by imitating the method which nature follows in utilizing the blood clot as a support for budding blood vessels and cells toward rebuilding.

In the case that Dr. Fletcher describes and shows on the screen, of the deposition of cementum on the dentin of a broken tooth root, there has been no violation of laws governing all regeneration, unless it is in the depositing of cementum upon non-living matter, and in the root canal of the broken and *devitalized* dentin. This makes me think that the pericemental membrane was healthy and that it performed its function in a blind way. The normal pericemental membrane's natural function is to build cementum and build cementum it will, even under quite abnormal conditions. The obstacles in the way of our skillful surgeon have not as yet been entirely overcome. In this alveolitis we must believe that the same phases of the processes that we can follow step by step through microscopic observation in the web of a frog foot, when irritated, must occur, followed by the same phases of repair of the injured tissue after the removal of the irritant. We should expect to find a collection of cells and the exudates and the granulation tissue and the budding of the blood vessels and the gradual formation of scar tissue, followed later by the activity of the cementoblasts and the deposit of lime salts between the cells, and finally the gradual perfection of cementum. This must be as slow a process as the formation of new true bone. In order to protect and encourage these living and active processes the surgeon must avoid undue interference after he himself has made wounds by instruments and chemical agents in his efforts to help nature in removing the original irritants. His dressings must be protective, bland, non-irritant and aseptic. Atkinson, 40 years ago, tried to construct delicate platinum shields to cover the gums, wiring these to the crowns of neighboring teeth, to prevent disturbance from mastication and external injuries. This is a most delicate operation, requiring fine technique, good judgment and keen perception. All this is in the department of the dental surgeon. Now, as a dental physician also, he must look to the condition of the blood and lymph which feed the struggling cells in their work of repair. We know that these cells cannot perform their functions unless supplied with food—and recoveries and repair cannot be accomplished unless the metabolism of each cell is normal. Morbid plasma cannot support cells engaged in this work. The lack of normal plasma (or lymph) is the great source, I believe, of the numerous failures after our exquisite surgery with the best designed instruments.. We do not sufficiently appreciate the value of pure food for the cells. Living matter requires proper food and unless we can furnish this our curettes and scalers and reamers and drills are of questionable use. We cannot improve the quality of the plasma by local applications. Our surgery is only half our duty, even in this so-called "local disease."

I hope I have made this point clear. For this latter reason I have never been able to agree with those of my dear friends who have claimed that the removal of irritants is the cure for alveolitis.

Given healthy lymph together with our present fine surgery, and we may reasonably expect perfect recovery.

Given morbid plasma and recovery is impossible. Will this statement satisfy those among us who never touch these cases in their practices, because of their skepticism about our ability to cure alveolitis?

Dr. Fletcher has shown us today a possibility for repair existing in the vital forces of the pericemental membrane, which we must carefully consider in the technique of our fine oral surgery.

W. H. WHITSLAR, Cleveland: Dr. Fletcher mentioned the fact of Dr. W. H. Atkinson advocating the stimulation of gum tissue by sponge-grafting. Dr. Atkinson read a wonderful paper before the old American Dental Association in 1885 in Minneapolis. This was one of the most remarkable meetings of that Association. I had the honor to attend this meeting in company with our esteemed editor of THE DENTAL SUMMARY. We had but recently graduated from college and were spending our first money in that pilgrimage. We joined the excursion of dentists which left in a special train from Chicago, and in Minneapolis we met the greatest collection of dental scientists that had ever met together. Dr. Lumen C. Ingersoll read his great paper on the duality of the peridental membrane. Up to that time the dental profession had in its mind that the membrane was dual in its nature, that is, that it came from the alveolar process, dipped down into the alveolus then arose upwards on to the side of the tooth. By a number of deductions Dr. Ingersoll proved that the membrane was not dual in its nature.

Dr. W. H. Atkinson in his paper showed how he reproduced gum tissue by sponge-grafting. I do not know whether he attempted reproducing bone. Many of us have tried the sponge-grafting process and I must admit that I was never successful. If bone could be reproduced, a large percentage of retention of teeth could be accomplished in the severest cases of pyorrhea alveolaris. Almost all the teeth are lost because the bony tissues have been destroyed.

The peridental membrane may be swollen as the doctor has said, and cause the teeth to appear loose, and so they are for a time, but it is the loss of the bony structure that greatly assists in the loss of the teeth. We see nature providing for production of bone immediately after extraction of teeth. What does nature do? It fills up the alveolar socket with new tissue, bone. What does it do on the alveolar processes when the disease is going on? We find hypertrophied bone on the external side of the alveolar processes. These same hypertrophies occur deeper down on the jaw bones, principally on the lower jaws. These hypertrophies are peculiar as there seems to be no cause for them, especially when occurring in the center of the palate bones, which enlargement is known as ''elephantiasis palatinis.'' This condition I have observed more among men than women.

Now, if we could stimulate bone to grow in order to replace that which is destroyed, then our fortunes are easily made. If that one factor in the treatment of disease could only be attained we would gain a wonderful advantage.

Regarding the peculiar case of Dr. Fletcher might I not ask if it could be possible that a part of the cemental membrane was carried over upon the crown of the tooth and there be a small deposit of cementum in a manner as is done in the teeth of herbivorous animals? It seems to me that I have read of a similar case, perhaps it was given by Prof. Sudduth in the old American System of Dentistry.

DR. HOFF: This is a very interesting question to me. I am not a scientific pathologist. I am only a clinical pathologist, and I could not add to the scientific knowledge already brought out by anything I may say. I had a hope that Dr. Hartzell might clear up this pathologic condition for us, but he has left me as much in the dark as to actual conditions as I was before. I just want to say one word, however, in regard to what Dr. Fletcher has given us. He has thrown out a challenge for somebody to tell him whether he is wrong or right about this name alveolitis. I have put him right about this name three or four times, but he won't stay right. I don't think it is any use, he won't give up his hobby. I have given him a name for it, and he won't accept it any more than I will accept his. I don't think it is necessary for me to spend more of your time talking about this name. If he means alveolitis in the sense I understand him to mean it, that this disease is initiated as a disease of the bone, I think he is mistaken, and I was in hopes Dr. Hartzell would tell him so. It is not primarily a bone disease, the bone affection is a secondary stage of the disease. It is not initially bone disease, except possibly when it is produced from a specific disease, it may in that case start as a bone disease in its primary stage, otherwise it is not a bone disease at first and is not entitled to the name of alveolitis; that is if he derives the name from a disease of the bone rather than a disease of the socket. If he means a disease of the socket and alveolus, then his name will go with me, but I don't like it in any other sense.

Dr. Fletcher (closing): There seems to be some discussion about the name alveolitis. I think the name had been used before I used it, yet I cannot refer to where it was. It seems a perfectly rational term for the disease when we consider the location, especially in view of the fact that I believe the bone to be the primary factor. Dr. Hoff is one of my friends that I can differ with, yet we have just as good a time as though we agreed and I don't know but that in this way there is a little more life in it. It doesn't matter, however, what we call the disease so we know what it is and how to treat it successfully; this is the main feature. Similar descriptive names are given to diseases of bone and flesh in other parts of the body and for this reason I believe the name alveolitis should be used.

Dr. Wright refers to plasma of the blood, which is simply a discussion of the constructive and destructive metabolism of the body. It is a known fact that every disease or wound, be it ever so small, has its nervous phase. It was shown by Dr. Price this afternoon that even fatigue has its nervous phase. Now, we may have a nervous phase to the diseases of the gums and sockets just the same as we have in other diseases and the metabolism of the body is thus affected. We thus have the systemic effects and probably the systemic causes of this disease. However, I believe that by far the larger majority of this trouble starts with local irritation, which in turn may have a decided effect upon the general system.

As to the infection, I don't believe that any one bacterium is responsible, although there has been some effort in times past to show that the disease is due to some special germ. We may have infection from many different germs for many varieties inhabit the mouth all the time.

Dr. Barnes: How do we know this deposit or these tumors are cementum?

Dr. Fletcher: The word deposit is illy chosen for this tissue. It is not a deposit; it is the product of a tissue-building membrane just as bone is the product of a tissue-building membrane. We look upon tartar as a deposit or a precipitate. We do say the cementum is deposited on the roots, but it is a tissue not a deposit.

Dr. Barnes: If cementum, why is it subject to disintegration, while permanent cementum is not in the agent noted?

Dr. Fletcher: Are you sure it is not?

Dr. Barnes: My examination of it proved to me it was not.

Dr. Fletcher: Answering your question as to how we know this is cementum I would say we know cementum under the microscope just as we know any tissue of the body. One can tell in this way what they are looking at whether glandular, brain or nervous tissue and so on through all the tissues of the body. The characteristic bone cell is of different shape and more regular in form than cementum cells, as was shown in the specimens, and entirely different in appearance from dentin. I had a section of bone which I intended to have shown, but I was afraid of making the paper too long. Macerating the teeth in this particular fluid simply indicates to me that the lime salts are being dissolved or disintegrated and more easily so than dentin, because it is more open or porous. It is a fact that if these same teeth were macerated in a proper acid solution the dentin will peel off in layers, just as the cementum has done in this instance, and yet there can be no question about there being perfect union in the different layers or parts of the dentin.

Dr. Hartzell indicates that he thinks this growth on the broken surface is bone instead of cementum. Am I right, Dr. Hartzell?

Dr. Hartzell: Yes.

Dr. Fletcher: As stated in the paper, I conceive the physiology to be that this bone-forming membrane coming in contact with healthy clean dentin is thus induced to produce cementum as explained in the paper; cementum is only found adherent to ivory, ordinary bone will not do this. The mere building up of bone in the sockets does not create a union with the root. We may have teeth held in this way as a nail is held in a board. Implanted teeth are thus held in and because there is no vital union must finally be absorbed or expelled. Pulpless teeth still retain the vital union through the cementum. Whether there could be additional cementum built upon the roots of pulpless teeth I do not know, but can see no reason why. It is plain that the new material built upon this broken surface of dentin is not strongly adherent, because it broke away easily in pressing down the cover glass, but I have specimens I should like to show Dr. Hartzell under the microscope, in which the adhesion is complete and perfect. Comparing the new material upon the broken surface of dentin with that upon the root of the same specimen shows them to be identical and different from bone; it is also continuous with the original cementum. In extracting it adhered to the tooth as a part of the cementum. All these reasons and more make me believe it to be cementum instead of bone. To be sure, cementum is a modified bone, but the modifications are distinct; again, true bone is never adherent directly to the root and cementum is never found any place excepting on ivory opposing the pulp of the tooth. This holds true in both animals and man. I shall be glad to show any one these specimens under the microscope; they cannot be properly studied otherwise.

THE ANATOMY AND PHYSIOLOGY OF THE GUMS AND SOCKETS.*

By W. H. Whitslar, M. D., D. D. S., Cleveland, Ohio.

IN THE consideration of diseases of the tissues immediately surrounding the teeth, it is necessary to understand first their normal construction, then their use, before any attempt can be made to successfully combat disease. To recognize pathologic conditions of growth or atrophy one should also know the principles of the physiologic development of tissues.

Dr. Eugene Talbot informs us that the size of the teeth is the same as three thousand years ago, but that our jaw bones are decreasing in size. This would seem to indicate that, with diseases about the teeth, hereditary discrepancies play an important part in their production. Add to this the artificial changes made in the anatomic disarrangement of teeth by bad operations, and we perceive every inducement leading toward disease within the gingivæ and alveoli.

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*Read before the Ohio State Dental Society, 1910.

The object of this paper is to prepare the way for the reading of the papers to follow, hence it will not enter into the minute histology thoroughly, but rather seek to emphasize the construction of the tissues and particularize their usage.

The first thought in the study of the gums and alveolar tissues is to learn of what they consist and how their development occurs. The origin of these tissues will briefly be considered, for we must recognize them separately in their primitive stage to observe better the economy of their construction.

Within the human ovum, measuring from 1-240 to 1-120 of an inch in diameter, is the germinal vesicle, and within this is the germinal spot measuring 1-3600 to 1-2400 of an inch. The fertilization of this germinal matter results immediately in the cleavage of the cells of the ovum. This process, known as segmentation, eventuates in the production of two separate layers of cells which together form the germinal disc. Within this disc is noted the first indication of the embryo, called the primitive trace. In the region of this trace the two layers of cells above noted, now called the epiblast and hypoblast, fuse together and from the sides of this line of fusion cells grow into the space between the epiblast and hypoblast to form the mesoblast. From this point on to the perfect development of the embryo, and from its birth to the assemblage of all the parts of mankind,

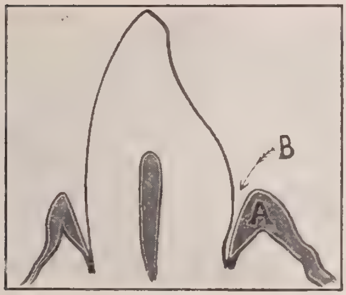

Fig. 1.

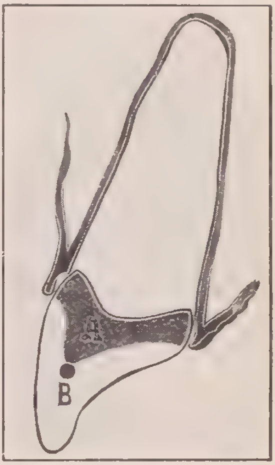

Fig. 2.

Fig. 1.—Diagramatic representation of the comparative thickness of the epithelial tissues on the labial and lingual sides of the teeth. A is the gingivus on the lingual B is the gingival cul de sac.

Fig. 2.—A representation of the proximal gingivus. A the gingivus approaching the contact point.

the human body is a wonderful story of the genius of the Creator. It is here sufficient to say that from these three layers of cells all other tissues are developed. Each has its anatomic department to organize and its physiological duties to perform.

The epiblast forms the outer covering of the body and the whole of the nervous system. It includes all the involutions of the epidermis, the mucous membrane of the mouth, the ducts of the superficial glands, brain and portions of the eye, ear and nose, which are formed from the brain. It forms the enamel of the teeth.

The hypoblast or under layer of cells forms the alimentary passages, except the mouth and a small portion of the rectum, which are formed by involutions of the epiblast.

The mesoblast forms all the rest of the embryo, viz., all the vascular and locomotor system, the cutis or true skin, and the connective tissues. It forms the dentin, cementum, pulp, peridental membrane and alveolar processes.

We learn from the disposition of the tissues that the epiblast is the parent to all the outer coverings of the body, the epidermis, mucous membrane, enamel, hair and nails, all of which are *protective* structures. Each of these is arranged particularly for its physiologic office. The skin serves as a covering for internal organs and is a means of elimination of internal waste products through its glandular structures; the mucous membrane performing a similar office, also providing lubricants for the mouth, as well as products aiding in the predigestion of foods. Enamel, the hardest structure of the body, is a protector of the dentine and pulp of the tooth and provides suitable resistance necessary in the function of mastication. Hair protects the eyes, ears and nose, and is the natural protection for the head in place of the "head-gear" now worn for adornment (?) by the feminine sex. All of these tissues are to the human family what a shell or horny covering is to the lower animals, an exo-skeleton, and I have thus laid stress upon them to particularize the function of the epiblast and its products so that when the gingival tissues are described the main conception of them is that they are protective structures.

The difference between the lower animal and the higher is the nervous system.

The nervous system establishes the dependence of the epiblastic with the mesoblastic products. It is the conveyor of those impulses which impel the building of the economy and the continuance of its functions. With its use the epiblastic layer of cells cease to live, because these are the older and when their purpose is served are cast off, but without its use the internal organs would not develop and the vital functions would cease. The nervous system controls the activities and harmonizes the performances of function. The lesser the distribution of nerves in a part the more mechanical is the use of that part.

The brain, which is the great central organ of the nervous system, is beginning to control the circulation of life fluid by the end of the third week of embryonic life, and at forty days, these currents are utilized in nourishing the cellular elements which are beginning to form the mouth. The embryo is 12 cm. in length when we find the epiblastic layer over the promontories, known as the maxillary processes, becoming thickened. This is the first evidence of the teeth. The osseous framework, however, has preceded this arrangement and the stretching of the epiblast with the underlying mesoblastic cells over the bones gives the mouth the appearance of a blind tube. Environment now changes the epiblast as it develops from two layers into four, which is designated the epidermis. These are situated upon the dermis or true skin which is of mesoblastic origin. The epiblast has two layers at the fifth week, the mesoblast has the papillary layer at the fifth month. The epiblast, contributing the germ for the enamel, loses activity earlier than the germ for the dentin, which is continued long afterward. The whole of the tooth is enveloped in a sac which is derived from the outer portion of the dentinal papilla. This sac, at first consisting of flat fusiform cells, soon forms round cells within, which move inward and assume the shape of the osteoblasts or bone-forming cells. The result is the deposit of a cemental matrix around the dentin until nature calls a halt and the remaining follicle becomes transformed into the peridental membrane.

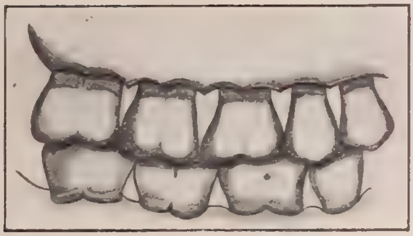

Fig. 3.

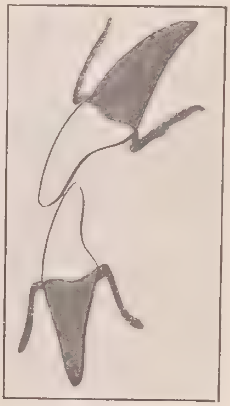

Fig. 4.

Figs. 3 and 4.—Note the convex surfaces of the teeth and gums over which the food glides into the oral cavity.

This is a brief description of the development of the tissues to be described. In the continuation of this description it is our desire to depart from the text-book routine of study and point out the essential points of anatomy with the purpose of analyzing their physiological importance.

We have heretofore considered the mucous membrane as a derivative of the epiblast and in the perfected structure it is a covering of the submucous tissue or true skin, which is the papillary layer in which are the blood vessels, nerves and glands. Over the alveolus this layer is rather thin. The blood vessels lie close to the surface, hence they bleed easily. The nerve supply forms a wide-meshed reticulum, and from this fibres are given off and terminate in end-bulbs, or, losing their medullary sheath, are distributed to the epithelium where the extremities may lie between the cells. The mucous glands are of the tubular variety and are not frequent in the mucous membrane about the teeth. They do, however, help to lubricate the free margins of the membrane about the teeth. The external layer of the mucous membrane requires more elucidation. It corresponds to the epidermis and loses some of the layers which appear in the skin, but the mucous membrane of the gums has some peculiar construction which cannot be better described than by the words of Dr. J. N. Broomell. He says, "The mucous membrane covering these parts is, on account of the numerous tendinous fasciculi which enter into its construction, extremely dense and tough, these characteristics being more strongly manifest here than in any other portion of the oral mucous membrane. These qualities are especially pronounced about the gingival margins and over the major portion of the alveolar walls, being closely bound down to the bone by direct prolongations of the tendinous fasciculi of the periosteum which penetrate the membrane." He also says, "Numerous elastic fibres are present. Three sets of fibres are to be distinguished in the mucous membrane of the gums—those that run vertically, those which pass in a horizontal direction, and those which radiate or are distributed fan-like. The last class are those fibres which are reflected from the peridental membrane and are distributed in fasciculi about the margins of the alveoli."

This description particularizes the density and toughness of the mucous membrane about the teeth and indicates the reason therefor, which again distinguishes the parts as *protective* structures. Upon these parts are, however, epithelium which, beginning as young germinative cells in the Malpighian layer, grow older and older until they become flattened and known as squamous epithelium. These are eventually cast off. This desquamation is an essay on Life as it is the fulfillment of their history. This process of growth may be known as repeated Karyokinesis until a vast accumulation of the older cells occurs. Abrasion removes these cells in the mouth, as well as on external surfaces, and frequently diminished desquamation of the outer cells will result in a thickening sometimes pathologic in character.

In the palms of the hands and soles of the feet are common examples of excessive accumulation of cells. The mechanic who uses his fingers will have an excess of these cells. A first-class bricklayer may lay one hundred thousand brick per year without using gloves and his hands not become worn out, but there are no gloves manufactured that would not be reduced to shreds in this kind of work. Livingston reported large callosities occurring upon the shoulders of porters from heavy weights laid upon them. Violinists and dentists may acquire hardened surfaces upon the finger tips by the constant exercise of these parts. Certain apes have callosities upon their buttocks. Finger nails are examples of outgrowth of the cells, and the teeth of rodents no longer meeting opposing teeth have excessive growth. Our worthy President, Dr. Fletcher, has called my attention to the callosities found upon the tongue and mucous membrane of the ruminants, the ox, sheep and lamb, also the hog, which show that the rough usage of the mucous membrane of the mouth toughens it. This he will illustrate at this meeting with specimens.

This all goes to show that the epithelial tissues are active in their processes of accumulation when required and are essentially *protective* structures. In man the arrangement of the cellular elements about the teeth is with special reference to this protection, i. e., they are greater in number upon the lingual surfaces to resist the pressure of mastication. Diagram No. 1 in silhouette form will illustrate this fact. The gradual thinning of the cells on the sides of the cul-de-sac formed by the gingivæ will illustrate the necessity of protection from both mechanical and infectious irritation.

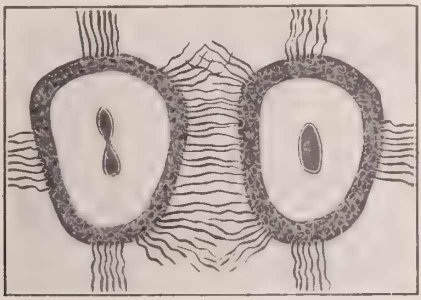

Fig. 5.

Fig. 5.—Diagram representing the different directions of the fibres of the peridental membrane. In the interproximal portion the fibres may interlace over the alveolus.

The accumulation of cells and the deeper layer of the mucous membrane with its fasciculi to form the interproximal tissue is of really serious importance since its destruction leads to alveolitis in all its forms. This is triangular in appearance when viewed from its mesial, distal, buccal or lingual sides, and is pyramidal in form with its base resting upon the alveolar process, and the apex at or near the contact point, the location of which should be thoroughly understood. Diagram No. 2. The mesial and distal surfaces correspond with the concave surfaces of the teeth approximating each other, and are slightly convex. The buccal and lingual surfaces are more convex to direct food to glide over into the oral cavity. Nature teaches us to preserve these rotund characteristics, particularly of the interproximal tissue. There are no right angles in the normal condition, but heredity or interference with the natural conditions may disarrange the harmonious development. Diagrams Nos. 3 and 4. The gum tissues include all the tissues covering the crest of the alveolus to an imaginary line approximately midway between the crest and the apical space in the alveolus. This depends upon the size of the alveolar processes and their junction with the maxillæ. In the lower the maxillæ is heavier whilst the alveolar processes in the upper jaw are more like protuberances.

The peridental membrane and alveolus are *supporting* tissues inasmuch as they hold the tooth in place.

The alveolar processes are to provide an immovable articulation in which the teeth are placed like a peg in a hole. This attachment is called gomphosis, and is found in most mammals. In most fish and some reptiles the teeth are fixed by a hinge joint or membrane. The bony tissues forming the sockets for the teeth consist of the usual bone, histologically speaking, with its lacunæ, lamellæ and Haversian canals. The bone is quite dense externally, but on the interior of the alveolus it is frequently perforated by fine openings for blood-vessels and nerves, the largest opening being at the bottom for the passage of vessels and nerves from the main near-by trunks.

The peridental membrane which surrounds the root of the tooth is derived from the dental follicle. It is the means of attachment of the teeth. It serves as a suspension cable to retain the tooth in its place and also as a cushion which lessens the concussion from mastication. The great strength of these membranes, together with the teeth, is shown in the marvelous exhibitions of strength by athletes in supporting weights. In ordinary mastication, Prof. Black informs us, that from fifty to as high as three hundred pounds' pressure may be exerted upon the teeth. One is also impressed with the strength of the peridental fibres in orthodontia operations. Depressing a tooth in its socket or rotating it are the most difficult operations to perform. In the last movement fibres at four angles are directly opposed to the movement. Diagram No. 5. The lingual and labial movements are not so difficult to make. This shows the supportive power of the membrane and alveolus.

The peridental membrane is thicker in childhood, and in measurement, in adult age, ranges from 0.2 mm. to 0.3 mm. in width, and from 8 to 20 mm. in length. It consists of white fibrous tissue which is not elastic. These fibres are of two classes: the long, or "principal" fibres, extending from the cementum to the alveolus, and the "secondary," which fill the interspaces with the blood vessels, cells and nerves.

The principal fibres are gathered together to form wavy bands, which at the neck of the tooth pass outward to meet fibres from the periosteum of the alveolus in such a manner as to designate them the "dental ligament." In the apical space the fibres are not so regular or frequent, the space measuring about 5 mm. in depth, and is filled with small fibres, cells and vessels. The arrangement of the peridental membrane is complex, but is generally understood by the practitioner. The fibres run at right angles, as a rule to the surface of the cementum. Those at the gingivus are more slanting because of fibres from the periosteum of the bone decussating with them. One can hardly give a satisfactory description of these fibres without examination of high-power microscopic specimens. Diagram No. 6 illustrates the direction of the fibres.

The cellular elements consist of fibroblasts distributed throughout the membrane. These are flattened and spindle-shaped and develop into the fibrous tissue. Osteoblasts are found external to the bone and cementum. They are the bone and cementum formers. Those forming cementum are called cementoblasts, but are identical with the osteoblast.

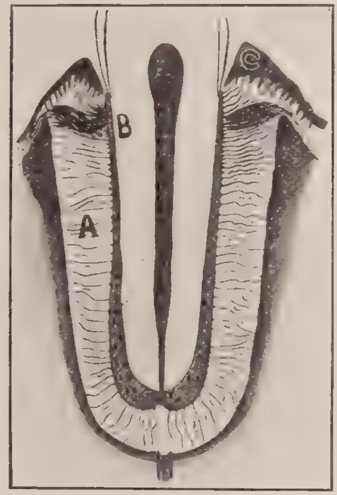

Fig. 6.

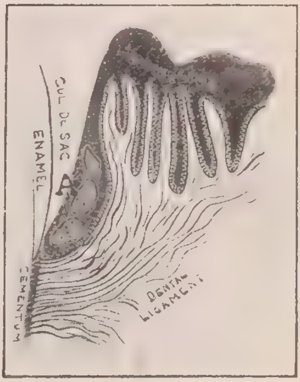

Fig. 7.

Fig. 6.—Diagramatic representation of the direction of the peridental fibres, A. B dental ligament. C epithelial tissues.

Fig. 7.—Diagram of the gingival tissues. A, the gland of Serres.

A giant cell containing many nuclei is found when absorption of either bone or cementum takes place. These cells lie close to these tissues and act viciously upon the principal fibres which are fastened into the cementum and as such are known as Sharpey's fibres.

At or near the gingival border is a small lobulated mass of connective tissue cells. It has a glandular appearance, but Dr. R. R. Andrews considers these cells to be histologically comparable to young enamel organs. This is called the gland of Serres. (Diagram 7.)

The peridental membrane is supplied with arteries and veins, these coming from three sources, i. e., those coming through the foramen at the bottom of the alveolus, through the alveolar walls, and from the mucous membrane. These lie in the central part of the membrane and are abundant. The nerve distribution has been meagerly accounted for, but Dr.

Frederick Noyes states that six or eight medullated fibres enter the apical region in company with the blood vessels. There is no doubt their distribution is ordinarily sufficient to make the membrane sensiferous.

The functions of the peridental membrane are of three natures, the physical, sensory, and vital. The physical has been referred to in the support it gives to the teeth. The vital was also alluded to in another place wherein reference was made to the constructive cells, the osteoblasts and cementoblasts forming bone and cementum. While these cells have similarity in appearance, the cementoblasts form a more tenacious grip upon the cementum by having the principal fibres more deeply imbedded in the cementum than in bone. Thus a vital connection is held with other tissues though the dental pulp may be dead.

By sensory function is meant that of "touch." This enables the early diagnosis of inflammatory conditions within the peridental membrane. The act of closing the teeth ordinarily is without sensation, but irritation to the nerve terminals designates the situation readily to the dentist.

Percussion upon the tooth in inflammation of the membrane gives a dull sound, and, depending upon the position of the impression made with an instrument, it enables early diagnosis of the location of the inflamed area. In this manner information is obtained to locate which root of a molar or bicuspid is involved. The dullness depends upon the degree of inflammatory condition by which the elasticity and continuity of the tissues are affected.

In conclusion it should be reiterated that the gums and sockets are *protective* and *supportive* tissues, and fair knowledge of their anatomy is essential before treating pathologic conditions.

It is believed from the thoughts expressed herein that physiological exercise of these tissues will render them stronger for the duties of life, and that every practitioner fails in his duty when he does not educate his patients how to perform these duties to themselves.

DISCUSSION.

H. C. Brown, Columbus: The anatomy and physiology of any organ or tissue is so positive in its nature that when a subject like this is presented by one familiar with the same, it permits of but little discussion. Dr. Whitslar is especially well qualified to present this phase of the subject. He has so intelligently and so completely treated the question that it would seem a travesty on my part to attempt to criticise it or elaborate thereon, and an imposition upon those present in consuming time that can be so well occupied with the subjects that are to follow, since it is the pathological conditions with which we meet that call for and receive our most careful consideration. While the anatomy and physiology of these tissues are fixed and positive, yet it is quite essential that we understand both before we are qualified to diagnose and successfully treat the various pathological conditions so frequently encountered in the oral cavity. A diagnosis is the first important step we are expected to take in treating any disease, and a thorough knowledge of the anatomy and physiology of the tissues involved aids very materially in making this step one that will permit of verification.

Only last week I received a letter from a former Ohio dentist, who is now located in North Dakota, giving a brief description of a case which was causing him and his patient more or less trouble. He had treated this case for some time for pericementitis, but without favorable results. While the history presented was brief, I had no hesitancy in saying that, in my opinion, the case was one of pyorrhea alveolaris. He had requested a diagnosis and suggestions for treatment, but after emphasizing the necessity for thorough instrumentation as the first step, I enclosed a reprint from the chapter on pyorrhea alveolaris in Dr. C. N. Johnson's late book, written by Dr. J. D. Patterson.

This may seem very much like treating the case by proxy, several times removed, but if the western lady receives the desired results through my diagnosis and Dr. Patterson's treatment, as applied by her North Dakota dentist, I am quite sure we should all feel satisfied.

W. C. **Teter**, Cleveland: It is apparent to all who have followed Dr. Whitslar closely through his excellent paper that his theme is protective and supportive tissues. The doctor has concisely and lucidly followed the theme from the very beginning of embryonic development through the various stages to the finished product, showing that all protective tissues develop from the same parent cell, the epiblast, and that the mucous membrane sustains the same relation to the underlying and more vital tissues of the mouth, and the enamel to the tooth, as does the epidermis to the tissues of the body. Likewise the supportive structures develop from the mesoblast. The dentin, pulp, peridental membrane, alveolus and periosteum are supportive structures, either physically or vitally, or both.

Following the same theme I shall endeavor to emphasize only a point or two. I wish to call your attention to the variation in the distribution of the fibers of the peridental membrane about the different gingival surfaces. Upon the labial and lingual surfaces they pass out directly into the fibrous tissue of the gum. On the mesial and distal surface the fibers pass over that margin of the alveolar wall and join the fibers of the neighboring tooth. This intermingling of the fibers of adjacent teeth enters into the formation of the tissue of the gingival organs and interproximate spaces, which is covered by a dense epithelial coating of moderate thickness, surrounded or surmounted by the peridental fibers, finally these fibers pass under the gum tissue proper and unite with the outer periosteal layer covering the outer alveolar wall. In this region we have three distinct unions of fibers, an intermingling of the peridental fibers with each other, direct attachment with the fibrous tissue of the gum, and a union with the periosteum.

In calling your attention to this feature of the distribution of the fibers I have not in mind the physical function. Since the peridental membrane is abundantly rich in blood vessels, nerves and lymphatics, the highly neurotic character of this tissue and its vital importance to normal function can readily be seen.

Now, let us see how nature has provided for the protection of this highly nutritive structure. In the immediate region of the necks of the teeth the gums are thin and hard and closely adherent to the periosteum; beyond this cervical line is the gingivus, which closely invests the tooth at the neck, but is in no way attached to it. Hence the term, free margin of the gum. These free margins labially and lingually are a series of imperfect semi-circles with the convexity dipping toward the alveolus and the points of junction piling up into the little pyramidal masses of tissue in the interproximate spaces.

The external covering of this tissue, as Dr. Whitslar showed, is comprised of tough, thickened epithelial cells. The anatomical appearance and the nature of the tissue of the gingivæ, according to Broomell, are strongly indicative of temperament and vary as do the teeth. "Thus in the bilious temperament these margins are inclined to angularity and the tissues are rather thick and firm. In the sanguine type the outline formed is almost a perfect semi-circle and the tissues are of moderate thickness and firmness. In the nervous type the curvature is strongly parabolic and the tissues firm and delicate. In the lymphatic the tissues are loose and thick and the curvature is long and poorly defined."

The interproximate spaces are completely filled with tissue in some instances and in others only partially, being governed largely by the shape of the teeth. The contours of the teeth, symmetry of the free margins, the pyramidal shape of the interproximate tissue are a wise provision of nature for the protection of the supportive structure of the gingival region. A thorough knowledge of the anatomy of these protective and supportive structure and an astute conception of the dire results from traumic injury is one of the greatest assets the dental surgeon can possess.

It is a great temptation to expand on the discussion of this phase of the subject, but as it is out of the province of the paper, suffice it to say that the induction of many pathological conditions can be attributed to nothing else but the utter disregard for rational and intelligent restorations.

Dr. Whitslar mentioned the three sources of blood and nerve supply to the peridental membrane. I wish to call attention to but one—the one that enters through the foramen at the bottom of the alveolus into the apical space. Here the great majority of blood vessels, nerves and lymphatics enter. I call your attention to the diagram and wish you to note how the supply is distributed, the relation of the pulp to the peridental membrane and what influence, if any, the destruction of the pulp would have upon that tissue. This study has been of great benefit to me and I expect to glean much from the discussions which follow and the other papers, and I hope this program will prove of great benefit to us all. I believe dentists as a class should know more of the anatomy, physiology, histology and pathology of the structures with which they deal and make practical use of such knowledge in their every-day labor.

Dr. M. H. Fletcher, Cincinnati: (Exhibiting specimens of animals' jaws—cow, sheep and hog.)

The specimens are presented to show the effect of constant hard usage upon the mucous membrane, and how it will respond to rubbing and pressure.

I have for many years been an advocate of the use of a stiff brush for rubbing the gums, with the result of developing in them great resisting power to disease and wounds.

You know all the ruminants have no upper front teeth. The lower front teeth stand horizontally forward as here shown. You may have noticed how the cow pulls the grass over against these sharp teeth with the tongue, then pulls the jaw up and cuts the grass off. All this rough material comes against the inside of the lower gums, and against the upper gums where there are no teeth. In these places there are heavy callosities developed, like that found on the palms of the hands and soles of the feet.

The molar teeth of these grain and herb-eating animals are more or less slanting on the sides, being the widest at the gum line. Down these slanting sides the food is forced and is constantly rubbing the gums, hence a welt of hard gum tissue is developed at the necks of the teeth, which is resisting to irritants such as tartar, wounds or infection. Now, this exact condition can be brought about in the human mouth by conscious, intelligent effort. That is, by using a stiff brush on the necks of the teeth and the gums at this point. First the brushing removes the tartar and prevents it from being an irritant. Second it develops the connective tissue and epithelium in and upon the gums, whereby they are able to resist wounds by picks, brush or hard foods, or by hard deposits or infection. If you have not tried the plan of hard daily brushing for the gums do so, but take your lesson from the rough materials which develops the thick healthy gums in these animals.

This specimen is the upper and this the lower jaw of a cow. These are of a sheep, and these of a lamb. This is the upper jaw of a hog showing the ruga on the roof of the mouth to be exceedingly hard and resisting, in addition to the hard gums. The mucous membrane and papillæ on the tongues and cheeks of all these animals also show the same hardening and resisting feature that is found in the gums.

These all beautifully illustrate what the constant rubbing of hard substance will do to the mucous membrane. If these animals ate no rough food I am sure you would find these features would disappear. Upon the same principle, if we should not use our feet to walk upon, the skin would become as tender on the bottom as on the top. The same would occur with the hands. The practical feature of this to me is, that the physiology of these parts in the human mouth is the same as in these animals and will respond to any legitimate demand put upon them. Human gums unscrubbed remain soft and delicate; rubbing them daily with a medium hard brush keeps them hard and resisting and prevents recession as shown.

This principle of response is always present and is the most potent factor in prophylactic treatment of the mouth and should be understood and drawn upon by all.

Dr. Ruggles: Would that hold good in the mouths of meat-eating animals?

Dr. Fletcher: It would if they used them. About the teeth that are used the most in carnivorous animals the gums are thickest. A dog that runs wild and gets plenty of bones to gnaw, will have much more healthy gums than those that are fed as human beings are. A dog that is continually kept on soft foods is subject to the diseases of the mouth that we are, as shown by Dr. Talbot. They are so subjected to disease because they do not clean the mouth and teeth by the rubbing of hard food. The greatest cleanser of the mouth and teeth is the proper mastication of the proper foods. The brush is only secondary to it.

Thus it is that physiology is always standing at our door to repair and protect, if we will but remove the hindrance and call upon her for protection.

Dr. H. T. Smith, Cincinnati: The histology and embryology of the teeth which the essayist presented, has been a very careful review of the subject. There has been, perhaps, for the last few years, very little work done in advanced histology of these tissues. Dr. Broomell's new work, which the discusser mentioned, is most excellent. The real work in the last two years has been done by Dr. Stein, of New York, the papers being published in *Items of Interest*. The particular points which Dr. Stein brings out in regard to the histology of the pericementum are that it is of the white, inelastic variety, and the fact that he traced the Haversian canal direct through the cementum and into the dentin, of course indirectly connected with the pericementum. Dr. Wright reminds me that the reproduction of the cementum is one of the points that is to come up, especially in this meeting. Another point in recent histology upon these issues is the investigation made by Mr. Collier, of London, as to the appearance of the gubernaculum in the developing teeth, the orifices showing also in dried specimens of jaws.

Dr. Whitslar (closing): Several weeks ago, when the executive committee asked me to write a paper on this subject, I thought I had so much to do with the meeting last year I should be excused this time. At the request of Dr. Fletcher, however, I could not resist the duty to our president. As the entire meeting is to be devoted to a symposium concerning the gums and sockets, it seemed to me that my paper should be one that would lead on as a preparation for the admirable papers to follow. Therefore I wrote the paper in that spirit. I laid particular stress upon the *epithelial* products as *protective* structures, and the mesoblastic products as *supportive* in their physiological activities, thus bringing ourselves to realize that if we take away the protective structures. the supportive ones are liable to destruction. This protective and supportive designation I think is a new way of putting these matters, which I trust you will consider.

The illustrations are, some of them, interpretations of illustrations given by Black, Talbot and others. I thank you for the kind attention you have given to the reading of my paper.

From the summit of power men no longer turn their eyes upward, but begin to look about them.—Lowell.

THE CONSTITUTIONAL SIGNIFICANCE OF PYORRHEA ALVEOLARIS.*

By George Edwin Hunt, M. D., D. D. S., Indianapolis, Ind.

THE TERM "pyorrhea alveolaris" is one used to designate a pathological oral condition, the objective signs of which, in its latter stages, are congested, tumefied, everted gum margins, pockets about the roots of the teeth from which pus and food debris may be forced into the mouth by pressure on the overlying mucous membrane, a fetid breath, malposed or loosened teeth and, often, recession of the gum tissue and destruction of more or less alveolar process. It is a highly prevalent disease and conservative estimates credit the loss of more teeth to it than to caries.

The term pyorrhea alveolaris, meaning a flow of pus from the alveoli, is a misnomer, since it merely describes one symptom of the disease. The term is the one among a score, most of them equally deficient, which has attained greatest popularity and in late years it has become so generally used by both members of the profession and the laity that it would be difficult to displace it.

Like many other diseases in the past, and even some few in the present, the etiology of pyorrhea is in dispute, a small but determined band of dental practitioners contending that it is purely local in its genesis and totally unaffected by systemic conditions. That view is not held by our ablest scientists, however, and I only mention it in passing to a brief review of the disease as described by our leading pathologists.

Two forms of the disease are recognized, one purely local in origin, the other induced primarily by the uric acid diathesis. The first form is perhaps best described as *ptyalogenic calcic pericementitis,* since it is a pericemental inflammation induced by deposits of salivary calculus, and the second form as *hematogenic calcic pericementitis,* since it is a pericemental inflammation induced by calcific deposits from the blood serum, preceded, it is true, by sodium biurate deposits in the peridental membrane.

Ptyalgenic calcic pericementitis has the following clinical history: Calcium salts, the phosphate and carbonate, are precipitated from the saliva and find lodgment about the necks of the teeth. Deposits first appear on the lingual surfaces of the lower incisors, close to the opening of the ducts of Rivini and Wharton, from the sublingual and submaxillary glands, and on the buccal surfaces of the first molars, opposite the opening of the parotid duct of the parotid gland. When first precipitated, these deposits have a soft, cheese-like consistence, a yellowish-white appearance and consist of the calcium salts mentioned, with food debris, exfoliated epithelium and micro organisms. In this stage they are readily removed by appropriate mechanical measures usually within the power of the patient, but if the physical conformation of the parts protect them, or the ignorance, unskilfulness or neglect of the patient permits their retention, they gradually harden by inspissation and chemical reactions and become darker in color. The deposition is progressive, being limited only by the imperfect efforts of the cheeks and tongue to remove the masses, or by the efforts of the patient or dentist.

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*Read before a joint meeting of the Marion County Medical Society and Indianapolis Dental Society.

As the mass hardens, it mechanically irritates the gingival margins of the gums. These gingival margins normally enclose the neck of the tooth in a collar-like fashion, but become everted by the deposits crowding down between them and the tooth. In gingivitis from other causes, the gums often become tumefied and everted, facilitating the deposition of these deposits. As the gum retracts from the proximity of the irritant, further deposits cause further retraction and irritation until, eventually, the peridental membrane is involved. A continuation of the process results in the detachment of the membrane from the tooth root and a depression of its physiological resistance to the point that pyogenic micro-organisms flourish.

The inflammation spreads by continuity and contiguity of tissue, the alveolar process gradually becoming affected after the inflammation becomes well established in the peridental membrane.

The diagnosis is not difficult. Chronic gingivitis, pockets about the roots of the teeth in which pus and food debris may be found, salivary deposits about the necks of the teeth and in the pockets, and, later, the tooth extruded, rotated and loose in the socket.

The prognosis, without operative interference, is hopeless, the tooth being eventually exfoliated. Sometimes this occurs in six months from the inception of the disease, although several years is more commonly consumed. If one-third or more of the peridental membrane is vital and the physical condition of the patient is fair, proper treatment of the case will always mitigate the symptoms and usually produce a cure of the pyogenic conditions, but the loss of alveolar process is permanent.

While more often seen in patients past middle life, this form of the disease may be found in any mouth in which neglect of prophylactic measures has resulted in the deposition of calcific deposits—the exciting cause. It is by far the most prevalent form, the great majority of cases being due to salivary deposits.

The hemotogenic form of pyorrhea is one of the Protean manifestations of the gouty diathesis. Those who deny this view base their argument on the fact that the local manifestation disappears if the tooth is extracted. As the uratic deposit takes place in the peridental membrane, which is either removed with the tooth, exfoliated later, or absorbed, this argument would be equally applicable to gouty tophi in the metatarso-phalangeal joint or in the helix of the ear. Amputation of either the great toe or the ear will eliminate all chance for further local manifestations in them.

The immovable joint between the tooth root and the alveolar process is completed by the reflection of the periosteum lining it, which membrane in this locality is known as the pericementum. Often the depression of vitality in it, which permits the deposition of uratic tophi, can be definitely traced to operations which have slightly inflamed it, as in wedging teeth apart or regulation of them, but in the majority of cases, as in other parts of the body, these predisposing causes are unknown. In any event, the sodium biurate is crystallized in the membrane in the same manner it appears in cartilage, mucous membrane and other tissues. It serves as a further irritant to that and the contiguous tissues. Either synchronous with this deposition, or shortly thereafter, deposits of calcium salts, principally the phosphate, take place on the cementum of the tooth root. This is in perfect accord with gouty manifestations in other localities. Strumpell[1] calls attention to the calcium phosphate in deposits and Wells,[2] says, "After a time, however, calcium salts may be deposited, and Dunin[3] has observed deposits resembling gouty tophi that were merely calcium salts."

It is not my intention to walk in where pathologist angels fear to tread, so I will not venture an assertion as to whether tissue necrosis precedes or follows the deposition of tophi, but will content myself with stating that it occurs. The necrotic condition extends, often without suppuration, until an opening into the oral cavity at the cervex of the tooth is made. This permits the ready ingress of micro-organisms and food debris to the pocket and the future clinical history of this phase of the disease resembles that of the ptyalogenic form previously described. In some cases a pericemental abscess supervenes before necrosis has extended to the gingival border, the pyogenic organisms reaching the affected part either through the circulation or through the tissues from the gum margin.[4] In this event a fistula may be established through the alveolar plate and overlying gum tissue.

The diagnosis of hemotogenic calcic pericementitis in its early stages is attended with some difficulty and the disease is often overlooked by the dentist. A low grade of pericementitis in a tooth with a living pulp, especially if there be an area of congested gum tissue near the apical third of the root, is presumptive evidence. The X-ray will generally give a positive diagnosis. A pericemental abscess on a root with a living pulp would indicate it. After an opening at the gingival margin has been established, or before then, if practicable to secure any of the deposits from the root, the murexid test will give the characteristic uric acid reaction.

The prognosis is doubtful. With local treatment alone the disease may be arrested and eternal vigilance on the part of the patient and dentist may hold it in *statu quo*, but its recurrence is certain unless efforts to arrest

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1. A Text Book of Medicine, by Adolph Strumpell.
2. Chemical Pathology, by H. Gideon Wells.
3. Mitt. Grenzgeb, Med. u. Chir.
4. A Text Book of Dental Pathology, by H. H. Burchard, re-written by O. E. Inglis.

it are unceasing or the constitutional condition changes. Anti-gout treatment in connection with the local treatment is indicated.

Either form of this disease may involve any number of teeth in the mouth. With several teeth affected badly, a considerable quantity of pus is emptied into the oral cavity each day. Every bolus of food is impregnated with pus. Every swallow of saliva is infected. The result of weeks and months of this cannot but be deleterious to the general health of the patient. The amount of pus formed and swallowed from these diseased teeth may produce effects varying from a simple gastric derangement to a severe case of actual septic infection.

Burchard says, regarding this, "R. L. Watkins, M. D.,[5] has examined the blood of pyorrhetic patients, and has found a mild condition of septic blood similar to, but less than found in puerperal fever and advanced sarcinoma and in other infective diseases.

'Goadby[6] reports the cure of a case of profound muscular weakness, mental depression, and insomnia after unavailing general medical treatment for neurasthenia, as following the extraction of teeth affected by pyorrhea.

'Hunter and Leith[7] have described cases of subacute and chronic catarrh of the stomach and phlegmonous gastritis due to the ordinary pyogenic cocci, such as are found in the mouth, and which the gastric juice of the stomach of the particular individual at least was not competent to kill. Considering the fact that an oral subacute catarrhal condition is established in pyorrhea, the local transfer of the affection is not surprising."

(It is in my mind that experiments conducted since the above report was made, prove that practically all varieties of bacteria may pass from the oral cavity through the stomach into the intestines unharmed.—Hunt.)

"Park[8] believes many cases of appendicitis to be due to oral infection.

"Kirk adds to this list pernicious anemia, broncho-pneumonia, malignant endocarditis, pyemic lymphadenitis, etc., as possibilities of secondary infection or extension by natural contiguous channels."

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[5] Septic Blood in Pyorrhea, Robert L. Watkins, M. D., *Items of Interest*, December, 1904.

[6] Pyorrhea Alveolaris, Kenneth W. Goadby, D.P.H., L.R.C.P., M.R.C.S., L.D.S. Odontological Society of Great Britain, April, 1902.

[7] Odontological Society of Great Britain, 1899.

[8] Surgery by American Authors.

To see in all mountains nothing but similar heaps of earth, in all rocks nothing but similar concretions of solid matter, in all trees nothing but similar accumulations of leaves, is no sign of high feeling or extended thought.—Ruskin.

DENTAL SERVICES FOR THE CRIMINAL.*

By E. F. Crowley, D. D. S., Chicago, Ill.

IN ACCEPTING the honor of presenting this paper to you I did not fully appreciate the extent of the obligation I had undertaken. Having no precedent to follow, I sent a circular letter of inquiry to all State Penitentiaries and Reformatories throughout the country regarding the services extended to their inmates. This letter was sent over the signature of John L. Whitman, who is recognized throughout the country as one of the leading criminologists of the day; and fortunately every institution with the exception of two or three replied, giving in detail their method of handling this work.

Before telling you what we do for the people in these institutions, I desire to direct your attention to some of the adverse conditions under which this work must be done:

In the first place, we are working on men and women, some of whom are the lowest type of humanity.

Secondly, they must be constantly watched while they are in the chair.

Thirdly, there are always from five to twenty awaiting their turn to see you.

And lastly, the majority of them never see a dentist when they are free and outside of the prison walls.

The largest part of our work consists of relieving toothaches and the extraction of teeth, but that does not mean that our work is limited to this branch of the dental practice, as in all institutions where a dentist is employed on a salary, he is expected to insert amalgam and cement fillings, the material being furnished by the institution.

The majority of institutions replying to my circular letter employ a regularly licensed dentist to visit the institution once or twice a week. He is expected to extract teeth, and insert amalgam and cement fillings where the teeth do not have to be treated, but where the teeth have to be treated, it is done at the expense of the prisoner. The prisoner also has the privilege of selecting the kind of work to be done in his mouth, providing he has funds on deposit in the office to cover the dentist's fee for the work. The dentist collects this money and retains it.

This arrangement exists in the following institutions: U. S. Penitentiary, Atlanta, Ga.; U. S. Penitentiary, Leavenworth, Kan.; Vermont State Penitentiary, Windsor, Vt.; West Virginia State Penitentiary, Moundsville, W. Va.; California State Penitentiary, San Quentin, Cal.; Minnesota State Penitentiary, Stillwater, Minn.; Minnesota State Penitentiary, St. Cloud, Minn.; Virginia State Penitentiary, Richmond, Va., Pennsylvania Eastern State Penitentiary, Philadelphia, Pa.; Pennsylvania Western State Penitentiary, Pittsburg, Pa.; New Jersey State Penitentiary, Trenton, N. J.; Illinois State Penitentiary, Joliet, Ill.; Wisconsin State Penitentiary, Waupaun, Wis.; Iowa State Penitentiary, Ft. Madison,

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*Read before the Indiana State Dental Society.

Ia.; Michigan State Penitentiary, Jackson, Mich.; Ohio State Penitentiary, Columbus, Ohio; Wisconsin State Reformatory, Green Bay, Wis.; New Jersey State Reformatory, Rahway, N. J.; Pennsylvania State Reformatory, Huntington, Pa.; Vermont State Reformatory, Rutland, Vt.; New York State Reformatory, Elmira, N. Y.; Allegheny County State Reformatory, Hoboken, Pa.

In your state penitentiary at Michigan City, Ind., an arrangement exists with a local dentist whereby he comes one day each week, or such time as is required to do the work, the agreement being that he is to do the work as cheaply as possible and give satisfaction. Whenever prisoners have funds of their own, or they are furnished by friends, gold fillings, etc., are permitted, but where the institution is required to pay the bill the more ordinary fillings are used.

In the United States Penitentiaries at Atlanta, Ga., and Leavenworth, Kan., if a prisoner is without funds and has served one or more years, and has one or more years yet to serve, the government pays for the work that is to be done. In this way the government paid out, in these two institutions alone during the twelve months ending July 1st, 1909, approximately $1,932.00 for extra work on the prisoners' teeth.

In the Missouri State Penitentiary at Jefferson City, Mo., and the New York State Penitentiary (Sing Sing Prison) at Ossining, N. Y., there are incarcerated regularly licensed dentists to whom this work is assigned. In addition to this the Missouri State Board of Dental Examiners hold their clinical meetings twice a year in the Jefferson City Penitentiary.

When first taking up this work, I was particularly impressed with the enormous amount to be done, and found it necessary to organize some definite system to care for the criminals.

My first request to the warden of the institution was the appointment of four "trusties" from the hospital corps to assist me; one of them to examine mouths and give permit tickets for consultation with me. This was found necessary, as on days when I was to work, there would be about one hundred in line with imaginary complaints, knowing that it would take me from one to two hours to finish looking them over and in this way they could have this time to sit in the line and converse with their fellow prisoners.

By appointing an examiner this was done away with as only prisoners who have been examined with tickets are permitted to sit in the line to see me. I have another man to keep books, that is, record work that I do, work that should be done and also work that has been done by some one else.

One of the other men does all the sterilizing. I have three sets of instruments and sterilize after each patient, as approximately 40% of people in penal institutions have syphilis or have had it. The fourth man assigned to my department is the porter, his duties being to keep my rooms clean and to run minor errands about the institution.

I visit the institution two days a week, Thursdays and Sundays, and see all men who have been examined. I divide the work, doing the extracting and surgical work on Thursdays, and on Sundays I do the operative and prosthetic work. The prisoner who does the examining assists me at the chair.

In the last three years of my prison work I have extracted about 2,908 teeth, and filled about 3,600 teeth, averaging 87 extractions and 100 fillings a month, this work being done in an institution averaging about 2,000 inmates *daily* and a floating population of about 12,000 yearly, receiving and discharging on an average of 40 people a day.

In addition to this, I have been afforded a wonderful opportunity in the oral surgical field, having taken care of about eighteen fractures of the lower jaw, six or seven curettements of the Antrum of Highmore, and about 150 or 200 chronic and acute abscesses involving surgical treatment.

Now, as I have previously remarked, while in most penal institutions there is provided to the prisoners, free of charge, dental services in the way of extraction of aching teeth, and fillings in the nature of "first aid to the injured," there is not provided in any such institutions, with the exception of the federal prisons, what is reasonably necessary for the adequate and permanent relief of the criminal suffering from decayed teeth, and other ills which affect the mouth, and which the science and art of dentistry can relieve.

We find, however, in all such institutions, hospitals with physicians and surgeons in regular attendance, whose services, in minor ills and complaints as well as in the most serious maladies, are entirely free. In all of these institutions necessary surgical operations are performed without charge to the prisoner, and medicines dispensed from well-equipped prison drug-stores without charge. In other words, in all penal institutions those suffering from disease or injury which may be relieved or cured by the services of a physician or surgeon, or the application of drugs, may obtain, without charge, any attention or medicines which their situation requires.

It will be readily admitted that many diseases are caused by neglect of the teeth, many cases of indigestion and other ills consequent thereon result from the inability of proper mastication due to malformed and decayed teeth, and following the line of reasoning here suggested, there are doubtless numerous cases of crimes committed which may be traced directly or indirectly to the condition of mind of the criminal produced by the irritability, nervousness, etc., due to the teeth as a prime factor.

Yet we find that penal institutions, which it is the boast of governments are primarily for the reformation of the criminal, fail to provide proper means for the reformation.

Extractions should be reduced to a minimum in prison as well as out of it. Cement and amalgam fillings are not means for permanent relief, and in many cases are wholly inadequate. I, therefore, recommend for your consideration that this matter be called to the attention of all penal or reform institutions to the end that all needful dental services, including appliances and materials needful for all cases, may be furnished to the inmates. If our penal institutions are truly for reform, then just as truly should the subject for reform receive freely that attention which perhaps he may never be able to afford outside the frowning walls.

DENTAL SERVICE FOR THE INSANE.*

By E. Laughlin, D. D. S., Evansville, Indiana.

THERE is a great opportunity, I believe, for your magnificent organization to exert its influence for lasting good, and that is in obtaining legislation which will secure proper dental service for the inmates of the various institutions for the insane.

On first impulse, no doubt, you will say it is no concern of yours whether dental service is provided for the insane or not, yet each and every one of you should be interested in this matter for two reasons: *First,* because you are a member of a profession devoted to healing and to alleviating suffering; *second,* because you are a taxpayer and should be interested in the disbursement of public funds in such a manner as to secure the best possible returns.

As to your professional obligation, there is no need for argument. As to the second phase of the subject, I doubt not some of you are asking "what has the disbursement of public funds to do with dental service for the insane?" It is this: The State of Indiana is expending practically a million dollars per annum for the maintenance of her insane subjects. These subjects, or at least a great majority of them, come from a class where dentistry is practically unknown. Their recovery, in a great measure, is dependent upon the restoration of their normal physical condition. Is it not reasonable to believe this restoration can be more readily brought about if they are first prepared?

Of what should this preparation consist? Primarily, I should say, oral prophylaxis and prosthesis. Then let the general treatment begin. I have not the slightest doubt the results, both as regards the time and ease with which improvement is brought about, would be astonishing.

Of over seven hundred mouths examined, less than three per cent. were found free from dental caries, but in a number of these mouths were found slight calcific deposits on the anterior inferior teeth. Thirty-seven edentulous arches were noted. Only a portion of these had ever been supplied with dentures, and a portion of these had either been broken or lost when the patient was disturbed. About twelve per cent of the mouths examined had at some time of other (mostly before commitment to the institution) received dental service. Nearly all of these were sadly in need of further attention. The great majority of the patients had never received dental attention other than extraction, which, by the way, is regarded as a panacea for adontopathy by the staff physicians.

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*Read before the Indiana State Dental Society.

I must impose upon your patience just at this time to explain the division of patients insofar as maintenance is concerned. Those who are absolutely dependent on the community from whence they came are known as County Supply. Those who have property or some other source of income are required by the state to provide clothing and any little luxuries they may desire. They are known as Home-Supply. Now, some one may ask why, if one of the latter class of patients should be in need of dental attention, would there be any thing to interfere. The only interference would be the inconvenience of removing an attendant from regular duty to accompany the patient to the office of some dentist, but as all the institutions have just a full quota of attendants, you see this works quite a hardship on the routine of the wards. Consequently, many cases badly in need of attention are allowed to pass unnoticed. Again, in many instances, mouths which are sadly in need of attention are allowed to go unnoticed simply because of their benign condition.

It is not my intention to advocate the embodiment of modern dentistry in the course of treatment for insanity, with the idea that a panacea for the multitude of mental maladies will then have been evolved, but merely with the idea that its association with the present treatment will, in many instances, greatly increase the possibility of recovery.

It is a much mooted question as to whether or not there is any cure for insanity. Alienism is a broad subject and has baffled science for years and years, but we are here concerned only with the relation of dentistry in ameliorating suffering among the insane and the enhanced possibilities of recovery in case such a thing is possible.

The past fifteen years, at least, have witnessed a continual advancement of the standard of Indiana's insane institutions. The Central Hospital has in connection with it an elaborate and efficient pathological department. Just at present the Southeastern Hospital is nearing completion. This institution is a model of all that is modern and best in hospital construction and administration. Yet, while all this is being done, while progress is being made in the study of mental disorders, etc., does it not appeal to you as strange that any measure, such as modern dentistry, with the possibilities it would afford in connection with the treatment of insanity, has been omitted? What the cause of this omission may have been is problematical. I sincerely trust it is not from any idea the medical fraternity may have had as to the merits of modern dentistry. In fact, that the attitude of the various administrative heads of the insane institutions throughout the state might be ascertained, I addressed a communication to each of them, asking what method was employed to secure proper dental service for their patients. To the four communications thus addressed, only two replies were received. Both were favorable to some measure which would correct this obvious need.

To any one familiar with the conditions as they exist, the need for some corrective measure is obvious; in fact, I can think of no better argument as to why dental service should be supplied these unfortunate people than the existing conditions.

Concerted action on the part of your organization can secure legislation which will provide dental service for the insane wards of the State of Indiana. Opposition will be forthcoming, no doubt; it was ever thus where an expenditure of public funds was involved, but if you will place this matter squarely before the powers that be, show them it is a service they owe to the dependent and helpless, that considered from the standpoint of finance alone it is justified, no doubt you will get the legislation you desire. You will then have rendered an invaluable service to the most pitiable of all sufferers, the insane.

ORAL HYGIENE.*

By W. T. Jackman, D.D.S., Cleveland, Ohio

ORAL HYGIENE is the subject of the hour. It is being discussed more than any other dental subject. And why not, for is not prophylactic better than operative or prosthetic dentistry? While prophylaxis is the central thought of oral hygiene, yet, to be practical, present day needs demand that both operative and prosthetic procedures be coupled with it. When the Christ who commanded us to love one another, said, "As oft as ye have done it unto the least of these my brethren ye have done it unto me," He was teaching a broad humanitarianism that took in all mankind. I do not know what you have been doing along this line in your state, but I do know that you have many indigent poor who are saying, "Nobody cares for me and therefore I care for nobody." From this class come nearly all of our worst criminals. Yet if a helping hand be extended to these, especially the children, they would soon come to know that somebody does care for them, and they would begin to respect themselves, with the result that a large per cent. of them would grow up to be useful men and women, crime materially lessened, and the world be made a happier, brighter place to live in.

The dental world is awakening, I am happy to say, to the fact that it has a part to perform in this great scheme of redemption. We as dentists have something more to do than the mere routine of office duty. We are not fulfilling our whole mission to humanity when we are shut in by four walls; not by any means. The poor of your state are looking to you for oral and dental help. Are you ready to heed the call? I am sure you are. Insofar as the helpless are concerned, we are surely our brothers' keeper, as our eleemosynary institutions testify. I am so sure that the spirit of brotherly love so prevails in this good state of West Virginia (for it is really a part of Ohio, you know) that it is wholly unnecessary for me to spend any time either moralizing or philosophising on the necessity for oral hygiene and its application to the poor. Perhaps I could do nothing better in a practical way than to tell you what we are doing in Cleveland and Ohio.

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*Read before West Virginia State Society, 1910.

After an intense effort on the part of the Cleveland Dental Society, we were first given the privilege, by our school board, to examine four typical schools, as to nationality. This we did a year ago last spring, and with startling results. We found that 97% of the children needed the care of the dentist. Just think of this, 97 out of every 100 children in our schools were found to be diseased,—either cavities in the teeth or other oral lesions,—the best place possible for propagating the tuberculosis bacilli or any other of the infectious or contagious diseases. Listen to what Dr. William A. Evans, commissioner of health of Chicago, says:

> "The children who have bad teeth are not having a fair chance. And why? I do not believe that the harm that is being done is largely through the neuralgic conditions that ensue from this bad condition of the teeth. It is Nature's method of showing that something should be remedied, and I take it that it is a call on the part of Nature to take heed. I do not believe that the major part of these defects is from infections that determine suppuration. There is a call on the part of Nature that is so persistent and so striking that it should receive attention. The major harm that is being done is from those children that have decayed teeth, these decayed teeth being harbingers of bacteria that slowly poison, and as the result of that slow poisoning there is, in many instances, enlargement of the neighboring glands, and those glands stand as vicarious sacrifices protecting the remainder of the body from the invading poison. And there is Nature's route in this group of children in which the poison goes by all sentinel glands and finds its way into the interior of the body. It is relatively easy, gentlemen, to see how the teeth decay, and also how the accumulation of filth takes place in those decayed teeth. It is not difficult to see the enlarged glands, enlarged by reason of the fact that they have offered themselves as a sacrifice for the protection of the remainder of the body; but it is far more difficult to see the reason why a child that is pale or anemic is anemic. Absorption is taking place from these infected areas, and the influence of that absorption is felt not only in the neighboring glands, but also in this group of physical conditions that are far removed and the relation of which is difficult to understand. It is not only difficult for the medical man to understand this, but it is far more difficult for the family to understand it."

As a result of this examination our school board has given us the privilege of examining the mouths and teeth of all the public school children and to establish five free dental clinics for one year, and to this is added an illustrated lecture course. These lectures are being given in the various school buildings by men selected by our society, and are entitled as follows: "The Physiology of the Teeth and Oral Cavity, and Anatomy and Development of the Teeth;" "Oral Prophylaxis;" "The Effects Produced by the Loss of Teeth and Other Faulty Oral Conditions;" "The

Care and Treatment of Diseased Teeth and Oral Conditions." A committee for each subject was selected by the society to prepare these lectures; then a large committee consisting of twenty members met and revised these lectures carefully before they were given to the public. Ninety of the 120 members of the Cleveland Dental Society pledged themselves to give a week's time to this work during 1910, or an equivalent of $33.00. Let me pause here to say that I am proud of my home dental brothers, for they are a band of noble self-sacrificing fellows, ever ready to help the needy. Philanthropy will always be a necessity, for the poor we will always have with us; and so this work must be started in this way, but while helping the helpless we must do something for them that is of infinitely more value to them, viz., educate them; teach them how to care for the mouth and teeth, and thus reduce the necessity for visiting the dentist to the minimum.

The details of our procedure are as follows: Some dentist is selected to have entire charge of the examinations, and he is held responsible for results. The examinations are made in carbon duplicate; a copy is sent to the parents of the child and the other is retained by the board of education. The examination is not intended to be complete, but sufficient trouble is noted to call the attention of the parents to the fact that their child needs dental attention. (Here examination blanks were introduced and explained). If the parents are unable to care, dentally or orally, for their child or children, then the teacher so reports, and they are cared for in the free clinic. Of course we are very careful not to do any free dental work for those who can afford to have some dentist do it in the regular way.

But, however, we lay most stress for permanent results on educating the public, which, of necessity, must be a slow and tedious process. There are two ways only whereby this work can be made perpetual. First, by philanthropists furnishing the money, and second by legislation. The first I believe to be impracticable. The second I believe is the better way.

Our work in Cleveland is, primarily, to get data to show the absolute necessity for making the work permanent. We must create a public sentiment that will demand legislative action, and then only can we get appropriation of public moneys. My friends, the taxpayer must eventually pay the bills, and why not expend the money in a way that will be helpful to his fellows rather than spend much more in maintaining criminal members,—one in the eastern, one in the central, and one in the western part of the state? We have divided the eighty-eight counties into three parts, so that each member of the committee has a third of the state. We are endeavoring to get the dentists to work in the various cities and towns creating sentiment in favor of oral hygiene. Quite a number of cities have made and are now making examinations of the mouths and teeth of the school children. Youngstown, Canton, Massillon, Gallipolis, Findlay and others have made examinations, while Cleveland and Cincinnati are now making theirs. We hope to follow these examinations all over the state with illustrated lectures. I am happy to say to you that my State Society is heart and soul in the work, and voted my committee (Oral Hygiene) the sum of $500 last December, and more if necessary, to carry on the work for the year. We have thus been enabled to procure lanterns, slides, etc., and to furnish examination blanks wherever desired throughout the state.

This, my friends, is a brief outline of what we are doing in Ohio. It is but a mere start, but it is a beginning, and we hope that out of this effort will come appropriations of public moneys sufficient to care for every poor child of the state dentally. And, too, we expect that in time will come a compulsory dental law which shall mean that every man, woman and child shall have a clean, healthy mouth. It is coming, but this day will not come until the dental profession awakes to the fact that it can come only through and by it.

A few years ago (pardon the reference) the writer read a paper before the Ohio State Dental Society on "The Care of the Teeth of the Indigent Poor," referring particularly to the eleemosynary institutions of the state. As a result of that feeble effort the inmates of all those institutions are having more or less dental work done for them, the superintendents being fully convinced that dental services should be rendered these people, and are setting aside a portion of their appropriations for this much-needed work. A little later we shall have proper legislative appropriations for this purpose.

Dr. W. G. Ebersole, of my own city, is chairman of the Oral Hygiene Committee of the National Dental Association, and is, in the language of the street, "a very live wire," I assure you. He, with his committee, did more in the year ending last July for oral hygiene, in a national way, than all that had been done in all the years before. He has planned great things for the future which were given in his report at Denver last July, and which you should not fail to read when printed in the "*Cosmos.*"

Does it pay to be helpful? In answer let me quote a part of an article in the *Items of Interest* on "The Origin, History and Progress of Some of the Dental Clinics in New York City," by Beatrice C. Fairchild, D.D.S., New York:

> "Most of the work now being carried on in the clinics is done by a few public-spirited dentists, who recognize that to the poor, ethical, conservative dentistry is a luxury; who realize that the poor need to be educated in the care and preservation of their teeth, and that their children make apt and satisfactory pupils and are duly grateful for the efforts in their behalf in this direction.
>
> "In connection therewith, it can be truly said that the fact that more of the better dentists do not lend their efforts and encouragement to this philanthropic work is lamentable. It is one of the few directions in which charity can be dispensed without pauperizing either the giver or the recipient.
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> ### CHILDREN'S AID SOCIETY CLINIC
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> "The next clinic in order is that of the Children's Aid Society, in the school building at 552 West 53rd street. Through the efforts of Dr. Herbert L. Wheeler, Charles Loring Brace, Secretary of the Children's Aid

Society, became interested in the work and decided to introduce it into the 53d Street school as an experiment. In October, 1907, the equipment was purchased, and in February work was started. This clinic is under the personal direction of Dr. A. H. Merritt, and its work is worthy of the admiration and assistance of those who would know something more of institutional dentistry.

"The following quotation from the annual report of the Children's Aid Society will show exactly the kind of work done: 'An effort has been made in each case to put the mouth of the patient in complete order; that is, such teeth as could not be saved were extracted, decayed ones filled, the teeth cleaned, the mouth transformed from uncleanliness and disease to health and normality, and mouth hygiene encouraged. It is believed that to fill one or two aching teeth in a mouth in which there are several others requiring attention is of little permanent value to the patient. To do everything that is required to put the teeth in perfect order and the mouth in a state of health, and to then encourage the patient to keep them so by careful attention to cleanliness, thereby preventing in large measure further trouble, has been the principle upon which the work has been carried on. If in anything the ounce of prevention is worth more than the proverbial pound of cure it is in the treatment of these conditions.'

"It must be remembered that, although this child is one from the tenements, he need not always remain there. One cannot tell what position in life these children may be called upon to fill. In proof of this, quoting again from the annual report of the Children's Aid Society, it will be shown that many of their children have grown into splendid men and women, and the following noteworthy careers may be mentioned:

One governor of state.
One governor of territory.
Two members of congress.
Two sheriffs.
Two district attorneys.
One city attorney.
Four hundred and sixty-five business clerks.
Thirty-four lawyers.
Seventeen physicians.
Nine postmasters.
Six railroad officials.
Thirty-six railroad men.
Ten real estate agents.
Sixteen journalists.
Eighty-two teachers.
Seven school principals.
Seven members of the state legislature.
Three county commissioners.
One judge.
Twenty-seven bankers.
Twenty-three merchants.
Two school superintendents.
Three civil engineers.
Twenty-four clergymen.
Two college professors.
One county treasurer.
Two artists.
Two county recorders.
Three county auditors.
One clerk of the Senate.
Over three thousand entered the army and navy.

"From careful analysis of the records of all the children, it is estimated that 87% are doing well, 8% were returned to New York, 2% died, ¼% committed petty crimes and were arrested, and 2¾% left their homes and disappeared.

"Besides putting the teeth in good order, the child is instructed how to keep them so by a knowledge of the use of the tooth-brush. Each child is provided with a tooth-brush for the small sum of two cents, and if he cannot afford this the brush is given to him. A sample bottle of dentifrice is also given with the brush.

"The good results reached in this most fortunate school are due to the fact that dental attention is compulsory. Each child passes through the hands of the dental clinic once every year, from the time he enters the school at six years of age, until he leaves it at sixteen. Hence you will see that the foolish fear of the child or the ignorance of the parent plays no part in the work. A child whose teeth are neglected between the ages of six and sixteen, as a rule, suffers most serious handicap.''

Now, my friends, in closing permit me to say that if we are to be known as a liberal profession we *must* recognize the fact that the harvest is ripe. Shall we be equal to the garnering? Remember that the conservation of the health of her people is the first duty of the state.

ABSTRACT OF DISCUSSION

L. G. BEERBOWER, Terra Alta: I think we have proven beyond a doubt that we are interested in the work that the essayist has come to tell us about. We are very glad to hear of Ohio's splendid work along the line of dental hygiene, and especially so of the work being done in the city of Cleveland. We sincerely hope that these brethren may not grow weary in well doing, nor after establishing a high standard of efficiency along the line of humanitarian dentistry, become unmindful of the needs of other states which have not had the time nor the opportunity to take up this phase of the profession.

We must admit that the profession as a whole in our state has not made the advancement that might have been possible.

The only thing in my mind, gentlemen, is for us all to be up and doing, now that we know the work is to be done. We can't all become essayists and write a splendid paper like the one to which we have just listened, but we can all tell some mother something in our everyday routine of work that will enable her to help her curly-headed little boy or blue-eyed girl to become a better man or woman, and possibly save them a great deal of pain and inconvenience in years to come.

DR. J. R. CALLAHAN, Cincinnati: I consider this one of the most dignified steps that the dental profession has ever taken. I believe you will agree with me when I say that the dental profession has been shy on professional dignity; has not had the standing in the minds of the public that we sometimes have felt we deserved. I have always maintained that we got all the credit that was coming to us. We are not conducting our practices in the way that we should. This oral hygiene and prophylaxis gives us an opportunity to show what we are really made of; therefore I think it is one of the greatest movements that has ever come to us, and if we fail to grasp the opportunity we deserve very little.

Now, in Cincinnati we have been doing this work for some time. Our local society there, to begin with, appointed a committee, and we gave our committee $500 to start into business, and they began to try to get into the schools to examine the children. Then they came in contact with the politicians, and they wanted to know what there was in it for us, and what we wanted to do; and we had to keep hammering away for years; at least, the committee did. But they finally got permission to examine the children's teeth, and they carried on the examinations there for a time, and we all volunteered our services, and whenever the committee sent us word that we were to appear at a certain school house on a certain day we would go prepared to make examinations, and give our time without reward, except what we could get from our own consciences, which is a good deal when you see how much good is done by a mere examination. Children will take cards home and parents will look at them, and a large per cent. will throw them away; but when we get around to that school again and examine the children again and another card goes to the parents they begin to pay attention to their children's mouths.

I might mention just here a personal experience I had that I thought was interesting. I did not think for a moment that any of those cards would find their way into my practice; but one day a lady came to my office and seemed to be disturbed considerably, and said, ''I have been notified by the school authorities that I have neglected my child's teeth.'' Her family had been coming to me for a long time, but boys don't like to go to a dentist unless they have to, and this little fellow had apparently escaped—or else I had been careless; I do not want to excuse myself, for I might have overlooked it—but she was greatly excited; and when I explained the matter to her she was greatly interested, and, being a woman of wealth, she said, ''When you want some money to establish clinics, etc., I will be glad to help you along.'' But, as Dr. Jackman says, we would rather do this for ourselves for a time and then let the people help. I assure you that the people do appreciate what we are trying to do—I mean the wealthier classes who do not expect to send their children to a free clinic at all.

During the exposition just closed in Cincinnati we had an exhibit there in which we endeavored to show the people, those who might stop at our exhibit and show some interest, some of the conditions of the mouth. We had specialists there showing the teeth, and the blood and nerve connections, etc. You will be astonished how many of your own patients will be surprised to know that the teeth are connected with the bone and with the nerve fibers. Some of them seem to think that they are just set in the gums in some way; and we ought to try, as far as possible, to educate our patients, but all this goes with the day's work. We have established a free clinic in the city, and we employ one or two men to work in there and pay them out of our own pockets; and we expect to establish other clinics throughout the city. We rent a room and furnish it, near a school, if we can, and notify the children that if they come there with a certificate or letter showing that they are worthy people, and deserving of the service, we give it to them, and we are increasing our own self-respect, whether we do anything else or not. And I think nearly every dentist in the city society has notified the society that whenever they want to establish free clinics we will go into it.

In Boston they have had the experience that they are simply overrun; and they have established these clinics and they are calling for help; they don't know what to do. The applicants for services just simply flood the clinics.

Dr. Jackman is one of the best authorities we have in this work, but I want to say that the dentist who elects to go into this work heart and soul is going to meet with the commendation of the better classes of people in his community. The demand has forced me along very rapidly, and nothing is done in my office that gives the people the satisfaction that this work does, when it is carried out as it should be done. And if it has that effect in my office, what must it have among the poorer people who have had no opportunities along this line? Therefore, I say we owe it not only to the public, but to ourselves, to spend our time and money as liberally as we can, and—I don't know that I ought to say this—but it comes back to you in many ways.

Dr. H. C. Brown, Columbus, O.: I want to assure you that we in Ohio appreciate the work that Dr. Jackman has been doing along this line.

He made reference to some work which I did in connection with the state institutions. Possibly I may have done something in calling the attention of the superintendents of the various state institutions in our state by writing directly to the head of the institution, submitting a number of questions and requesting answers to these questions. I submitted a blank question sheet and left room for them to answer the questions asked upon the page submitted. This permitted of my getting these reports in good form for future reference.

I started out by asking the official to whom the letter was addressed, ''How long have you been superintendent or at the head of your institution?'' ''How many state wards have you under your care?'' ''What arrangements have you for rendering the necessary dental services to these?'' Then I asked who rendered this service, taking it for granted that an assistant physician did this in a majority of cases. I asked, "If an assistant physician attends to this, do you consider that his preparation and training is such as to thoroughly qualify him for the work?" I asked relative to the expense of the dental services of the institution during the year, and if they sent patients to a dentist in an adjoining city, was it not necessary to have an attendant accompany them. I wished to make it as emphatic as possible that the dental needs of those inmates should be cared for just the same as they should receive medical attention, and that also the dental irritations of various forms were possibly largely responsible for some of the minor cases confined in these institutions. One of the last questions asked was: "Would you approve of a dentist at your institution with the same rank and standing as an assistant physician?" Generally there is where there is just a little opposition. I believe, however, this is more of a thing of the past, as I am firmly convinced that the medical profession is looking upon us today in a different light from what it has heretofore.

However, conditions have improved and, as Dr. Jackman states, they are giving far more attention to the dental needs in these institutions than they have ever thought of doing in the past.

Dr. Beerbower referred to delivering a lecture or reading a paper before a teachers' institute. I want to say to you that I think there is one of the best opportunities that the dental profession has today in order to reach the laity. There is no one in a better position to do a good work and impress the importance of any particular line of work, or any particular method of treatment, or call a child's attention to any defect in any more forcible manner, than the school teachers; and they should be well fortified for this particular work. And after we go before these teachers' associations and lecture they become the go-between, and they are in a much better position to impress some of these things upon the children than we are. They come in contact with them every day; when we do we are sometimes very busy and overlook some things that ought to be impressed upon them.

Relative to your medical and dental inspection, which Dr. Storer referred to, I believe by all means you should attempt to have dental inspection connected with your medical inspection legislation. . If you go in and work with them, you will give them your support and will receive theirs.

There has been a recent recognition of our profession that probably may not be generally known that I think carries a very considerable weight. You all know of Bellevue Hospital, New York City, one of the best known hospitals in the country. I was in New York City some ten days ago, and Dr. Wheeler, who has been referred to by Dr. Jackman, showed me a letter which he had just received from one of the officials, stating that they had decided to appoint a dental surgeon as interne, and asked for his co-operation and recommendations along that line. I don't think I am giving away any secrets, as Dr. Wheeler did not tell me this in confidence and I think he would be very glad to have it known.

In Boston a wealthy gentleman by the name of Thorndike, now deceased, created a fund by his will to establish dental clinics, and they are most fortunate in having the necessary wherewithal to conduct this campaign. They also have very enthusiastic men there, and I assure you you may expect to have a good report from Boston as this work progresses.

It largely remains with the dental profession to carry on the campaign for oral hygiene, and it will require a very great sacrifice of time and effort to bring about the desired result.

Dr. A. C. Plant, Wheeling: I am a great believer in oral hygiene; it is a pet subject of mine. We opened the eyes of a great many physicians in Wheeling last year at our last meeting, when we showed them the results of adenoids and enlarged tonsils; what results they had on the teeth and the facial contour. I think a great many of the dentists do not call the attention of the parents to the children who have adenoids or enlarged tonsils or mal-occlusion. If they cannot correct it themselves they ought to send them to some one who can.

Dr. E. L. Smith, Martinsburg: The last twenty years I have realized that we were not doing enough for children. Parents who were able to take care of their children's teeth were not doing it. There is nothing you can do for your children like caring for their teeth, and still there is nothing a parent neglects as their children's teeth. It is the hardest thing to train people in.

Dr. W. T. Jackman, Cleveland, O., (closing): I am very much interested in this discussion. I first get from it that the West Virginia State Dental Association is going to take up this work. I feel sure you are, because, as Dr. Callahan has well stated, you cannot do anything better, both for yourself and for your state, in a dental way, than to ''get busy.'' In speaking with your president, everything seems to be in readiness to begin work in Wheeling. He feels sure that they will have the co-operation of the physicians, and that is exceedingly fortunate. You cannot get the co-operation of the physicians everywhere.

I, perhaps, should explain relative to our clinics in Cleveland. The National Dental Association took up this work last year with a vim, and you will notice by the headings of these examination blanks that they are made under the auspices of the Cleveland Dental Society, Ohio State Dental Society and the National Dental Association. Now the chairman of the Oral Hygiene Committee of the National Dental Association, Dr. W. G. Ebersole, of my city, conceived the idea of getting the Manufacturers' Association to furnish outfits for these clinics; they to be used first in Cleveland and then in other cities. Now, let me say a word relative to this matter in your own state. Take Wheeling—I want to say to you that when you get the privilege and the co-operation of your school board and the physicians, do not stop with examinations. You will not need more than one free clinic in your city, and I know you have dentists enough there who will give of their time and money to establish the work. Dr. Callahan has told you what pleasure you will get out of it in looking after the poor who cannot look after themselves. You will cast your bread upon the waters to come back in such immense satisfaction in years to come that you will be happy and glad that you did it. One clinic in a city of that size I am sure will be ample to care for the indigent poor; and when you show the necessity for it you will enlist rich people, or you will get rich people interested. You know the sacrifices that physicians have made, and the result of their sacrifices. They have long since had legislation relative to the care of the poor. You know all over the country there are physicians for the poor, and the state pays the salaries of these physicians, and why cannot we have the same in dentistry? The mouth is the very beginning of good or bad health, and physicians are getting awake to the fact that it is necessary to examine the mouth of a child, find out the condition there first; especially are the younger physicians being trained that way. Work, work, work! If you meet with opposition, work the harder. You will meet with opposition. You won't find it easy. You will find a lot of jealous fellows, but if you get the physicians and the school board with you then you can go ahead in spite of anything. You must surely have your school board with you whether you have your physicians or not. Through your school board you get into the schools. In our own city we had a hard fight. We had some difficulty in getting our school board interested. We had a physician or two in our town who were determined that the thing should not be done. They were determined that the medical profession should do it, it was not the business of the dentists to do it. But we won out, and after we examined the four typical schools a year ago last spring, we had no further difficulty. We had a wise board and a wise superintendent, who were willing to sanction what we wanted to do and what we had done. I want to say that where there are only two or three dentists in a town—I practiced in a country town, and I know whereof I speak—there is always more or less jealousy among them. I am sorry to say this is so, for it ought not to be so. The trouble is, patients go peddling news about from one dentist to another, and I, like others, was disposed to listen to what the patients said. There isn't a particle of jealousy in the Cleveland Dental Society. There is some friction. There are always some kickers, but there is no professional jealousy in our society. If there are only two or three of you in your city, get together, talk it over, and all these petty jealousies will smooth out like oil on the water. You can accomplish things in this way. I know what I am talking about when I say so. Have a dinner together and you forget all little differences, and all those things work out themselves so nicely. I hope every town in West Virginia will get to work along this line, and am sure I shall hear great things from West Virginia later on.

In our National opening in Cleveland last spring—you read about it, probably, in the magazines—our school authorities were so interested in it that they dismissed the schools on the 8th of March, and over 2,100 school teachers helped to swell the audience. There were more than 4,000 people present in Gray's Armory. I never attended a more interesting meeting of its kind. Our school authorities are wide awake or they would not have done that for us. Now we are going right on with the work.

Someone spoke about addressing teachers' institutes. I want to say a word along that line, and that is, it certainly is one of the best ways to communicate this idea so that it will be effective. We must not forget that teachers are over-burdened by what the school authorities require of them at the present time; but let us impress upon the teacher that health is the first thing, and if she has to neglect something else let her understand that that boy and girl must have health before he or she can learn; and if she becomes enthused with that idea she will neglect something else for that particular thing.

In regard to literature, there is no literature as yet. It is new; nothing other than what you get through the dental journals. Dr. Plant, you might write Dr. Rauh, of Cincinnati. If you want some literature he would probably be able to give you some; and Dr. Wheeler, of New York City, he would probably help you out some; but we have no publications on this subject as yet—other than what you find in the dental journals. If you are at the national meeting you will get enthusiasm. You get so much that is not reported in dental journals, that you cannot get in any other way; so that is the way to get enthusiasm, and that is the way to get thoughts relative to this particular subject. As Dr. Callahan says, it is the subject of the hour, and we honor ourselves more than we honor those for whom we work. As a matter of fact, we have done little or nothing for the poor. Our central thought seems to have been to get into our dental offices and put in fillings and get it over with, and we think our duty is done. But that is a small part of life. We must earn a living, but nevertheless we can give some time to this, and if we do we will get a heavenly reward, a sweet consciousness that we are helping somebody else, and we couldn't get this in any other way, if we were working for ourselves and letting the other fellow take care of himself.

USES OF THE ROENTGEN RAYS IN DENTISTRY.*

By Will A. Quimby, M. D., Wheeling, West Va.

EARLY in the history of Roentgen rays its usefulness as a diagnostic agent was recognized in the science of dentistry. Only two months after its discovery Prof. Koenig exhibited the first skiagraph of the teeth to the Society of Physics at Frankfort, Germany.

Thus far skiagraphy has rendered invaluable aid, assisting the dental surgeon in diagnosticating perplexing conditions, and in confirming conclusions previously obtained.

For the successful use of the X-ray in dentistry sharp detail in negatives is necessary, and differentiation is required between tissues that

*Read before the West Virginia State Dental Society.

do not differ very much in the obstruction they offer to the density of these calcareous structures; in other words, the chemical components must show on skiagraphic examination—in fact, there is no bone affection which is not characterized by more or less skiagraphic features. The roots of the teeth are only a little less permeable to the rays than the surrounding bone, and therefore it is difficult to get sharp contrast between the two.

A radiograph is, indeed a shadowgraph. The difference in density of the structures causes the variety of shadows we see. Size, location and shape of a tooth, for instance, is much more easily ascertained than is the interpretation of its consistency.

As for the technique of dental skiagraphy, it concerns chiefly the operator; therefore not much space will be given it here.

Fluorosivic examinations in dentistry do not yield satisfactory results. The two methods used in this line of radiography are the intra-oral and the extra-oral. For the extra-oral work we use the small plates and the flexible films. The choice depends upon what we want and its location; each has its advantages and disadvantages. It is not best to undertake to obtain a picture of more than one or two teeth at a time, since the curve of the alveolar process will necessarily produce considerable distortion in the outlying portions of the film. Owing to the density of the parts, a medium to a high tube is used. The matter of a few seconds, rather than a two or three-minute exposure, is advantageous because of the distinctness of outline desired, and often the position of the patient is uncomfortable.

For the extra-oral exposures we proceed as for any other picture, placing the affected area nearest the plate.

In the interpretation of X-ray plates it is so easy to draw incorrect inferences from them that care must be taken to place the source of rays and the plate or film in proper relations, or distortions may occur and very erroneous conclusions will be obtained. Nowhere are the words "practice makes perfect" to be more realized than in this work. Even after the correct technique is carried out and good results obtained, the greatest skill is called forth in the correct interpretation of what we see. Metallic fillings are the most resistant to the rays; root fillings somewhat less dense. The enamel and dentin come next in density, while the root canal shows plainly in the dentin. The alveolar process and maxillæ cast a shadow in relation to their densities. Necrosed tissue, pus and other fluids give their characteristic haziness.

Coming directly to the utility of the Roentgen rays, I would say that probably the most frequent diagnosis rendered on a plate is that of abscess and necrosis. Just recently Dr. S. L. McCurdy stated that "the alveolar abscess, or the so-called pus sac, so frequently found on the apex of a tooth after extraction, is the forerunner of 90% of all the destructive diseases of the maxillary bones."

An acute phlegmonous condition about the alveolar process has a fairly clear train of signs and symptoms, but the origin of a chronic fistula in the oral cavity about the face or neck is a matter for considerable study. Repeatedly, instances have occurred where the wrong diagnosis was made on one of these parts with an unsuspected origin. The dentists and physicians alike cannot be too vigorously urged to be suspicious of any mass or fistula occurring about the face or neck, even to the shoulders and upper chest, lest it be of a dental origin. The same is true in regard to nasal passages and the accessory sinuses. Another thing: Do not be mislead by a fistulous opening and remove the nearest tooth to it. The nidus of infection may be the distance of one or two teeth from this point, having burrowed its way along the line of least resistance. This pus pocket and its tract can be detected on the X-ray plate.

In case of extensive necrosis, involving perhaps half a maxillary bone, the X-ray picture outlines the entire dead areas, this aid being invaluable to the dental surgeon. Without this guide, removing simply what material is in sight, a sinus having a channel for connection may be overlooked. Where this condition occurs in children a conservative operator demands this aid to avoid injuring any undeveloped or unerupted teeth.

The next most common pathological condition we diagnose radiographically is malposed, supernumerary and unerupted teeth. This not only insures a positive diagnosis, but aids the operator in correcting such deformities. The lower third molar is the most frequently misplaced tooth we find. The bicuspids are also frequently found lying in the wrong axis. Two plates we have at hand will illustrate these two types.

Along with this consideration we should not forget the possibilities of foreign bodies in the alveolar process, as broken broaches, metal and gutta-percha fillings which have been compressed beyond the apices. This accessory material is a source of irritation, resulting often in an abscess. An imperfect root, or an old root, as the result of incomplete tooth extraction may be imbedded beneath the surface. These are all inviting localities for local and perhaps widespread lesions, which, without the skiagraph, would not be discovered until far advanced. In case of infection in such fields, the picture simplifies matters greatly. In case of an infection or encysted lower molar, it gives one an idea about what is the most accessible point, and what diameter of the ramus remains beyond the root. After the removal of such a deeply imbedded tooth, a fracture at this point is not improbable.

From the fact that so much has been written on the treatment of root canals, and so many methods devised, this alone is quite convincing that there remains a good field for investigation. Probably our foremost means for investigation is the Roentgen ray. The percentage of bad results and septic canals is apparently low. Should these cases be examined a year or two later by radiograph, a large number will indicate inefficient treatment resulting in latent abscesses. Some will assert that when one of these hibernated abscesses is so dormant that both patient and dentist are unaware of its presence until discovered by the skiagraph, it is a harmless condition. The fact of the matter is, it is a source for continuous absorption of toxins, with its widespread ill effects.

In pyorrhea there is seen changes in the shadow of the alveolar process surrounding the tooth. The light area around the root signifies pus and rarification of the osseous structures.

Pulp stones, which are so perplexing at times, can be located with the X-ray. Some few workers take exception to this diagnosis, however. These stones are richer in calcareous salts than the dentine, thereby casting a denser shadow on the plate, giving contrast with the dentine. These calcific bodies vary from the size of a grain of sand to a mass that almost fills the pulp cavity. Their shape is variable, the smallest ones being symmetrical. The larger ones conform to the limitations of the pulp cavity, or they may be nodular. They are more commonly found in later periods of life, but are by no means rare in youth.

Every fracture, whether within the domain of a dentist or general surgeon, should be radiographed. A picture of the superior maxillæ and alveolar processes can be obtained, but especially should the mandible be subjected to such examinations. This bone is more accessible and better results can be obtained. Some time since a patient was referred for a picture who, while in a gymnasium, fell, striking the chin forcibly on the floor. A transverse fracture of the right ramus was found. This plate is here for inspection, showing the bone both before and after setting. Fracture of the tooth root has occurred and may be demonstrated by this means also.

A study of the facial sinuses is simplified by this valuable diagnostic agent. Serous fluid, granulations or pus will cast a hazy shadow, whereas the normal sinus will show a clear outline. Both a tooth and sinus may be involved in the abscess, or one affected and not the other. A tooth may abscess, destroying its bony socket and even the bony floor of the sinus, yet the membranous lining of the sinus remains intact. With sound teeth on the affected side, the radiograph negative, and neither growth nor necrosis present, it is fair to suppose that the sinusitis is due to some other cause than a tooth.

In regard to the relation of dental diseases to insanity, we would be a little reserved. Dr. Upson, of Cleveland, who has been making investigations along this line of work, is, perhaps, somewhat enthusiastic over it. The doctor says, in connection with the X-ray findings of patients suffering from melancholia and dementia praecox: "In nearly all cases the removal of the abnormal tooth was followed by an almost immediate improvement of the patient's condition." This would lead one to believe that an impaction is an etiological factor in these diseases. Recently an eminent neurologist of the east remarked to me that he would like further evidence before he accepted the theory that an impaction is one cause of dementia praecox. However, he continued that the widespread reflex resulting from malposed teeth—as insomnia, neurasthenia, depression and melancholia—are quite marked. Since radiography is a new means of diagnosing conditions that lead to mental diseases, we will have to await further development.

In all cases of persistent neuralgia about the face and neck, if ordinary diagnostic means fail, a thorough radiographic examination should be made in search of abscesses, pulp stones, impactions, tumor, foreign bodies, or any possible abnormality about the upper portion of the body. Here I might report a case. A woman thirty-one years old complained of more or less pain on both sides of the head and neck for a period of eighteen years. She had consulted various dentists and physicians in hopes that the seat of the pain might be located. An X-ray picture revealed the presence of cervical ribs. Another case will illustrate the aid of the Roentgen ray from the standpoint of diagnosing by exclusion. The right cheek of a three-year-old child became extensively swollen within twenty-four to thirty-six hours without any apparent cause. The family physician was called in. He being unable to locate the trouble, brought the case to a surgeon. They together considered abscess, tooth affections, sarcoma, etc. The surgeon, being an enthusiast on the Roentgen ray, referred the child for a picture. It revealed the presence of a common bone collar button imbedded in the floor of the right nasal passage. From the fact that this patient had a swollen cheek you, as dentists, were as likely to have been consulted as a physician. Ask yourself the question: How would I have proceeded had it come to me?

Another case for differential diagnosis is as follows: A lady forty-five years old had had all her upper teeth extracted and was wearing a full set of uppers. An area became prominent in the region of the bicuspid teeth. She consulted her family physician, who examined this mass and pronounced it cancer. Not being satisfied with this opinion, she went to her dentist. He made a diagnosis of an unerupted tooth. A picture showed it to be a tooth. This case, by the way, expresses the comparative value of a man's diagnosis which pertains to a subject outside of his own specialty.

Often the oral structures are radiographed to answer one or two questions that are in the mind of the dentist. For example: What is the position and condition of this tooth? Will it support a crown or bridge work? Is my broach going out through the dentine wall or into a curved root, etc.?

In orthodontia I am informed that there is a limitation to the adjustment of the tooth. The fixed point is the apex. If the axis of the tooth is changed in too great an angle, a constriction produced at the foramen will cause the death of the nerve. An X-ray picture will give the desired information concerning the proposed adjustment.

Thus far we have considered the rays only from the diagnostic point of view. In medicine its therapeutic uses are numerous, but in dentistry it is almost *nil*. All that can be said is that some practitioners find it aggravating pyorrhea alveolaris; others report that the congestion is relieved and the teeth become more firm. It is a matter of fact that exposures to the rays promote leucocytosis. Thereby, in a systematic way, it would aid this septic condition. The author has had no experience in this line of therapy.

In my closing remarks let the most lasting impression be—make a diagnosis before treating. Know the anatomy, pathology and history of the part in question. In this day of conservative dentistry it behooves one to use every attainable means to ascertain the abnormal condition, remembering that to extract a tooth that could be preserved is almost an equal crime to a surgeon's needlessly amputating a finger. Wherever a condition is very obscure it is much less humiliating to call in counsel who may throw light on the subject than it is to injure the patient or cause one's self to be censured through a mistaken diagnosis.

ABSTRACT OF DISCUSSION

Dr. W. E. H. Caldwell, Wheeling: The X-ray has brought to our profession what it has to medicine and surgery—one of the greatest improvements for diagnostic purposes. Frequently cases present where you are in doubt, and by the use of the X-ray we soon eliminate any possibility of a mistake in our diagnosis. In Wheeling quite a few of us have taken advantage of Dr. Quimby with very happy results. I can mention a case I had less than ten days ago. A physician was on his way east. His wife had been suffering for some time with a neuralgic condition, and he had consulted dentists wherever he had stopped, and apparently they did not know whether or not it was a tooth causing the trouble. I made a very thorough examination and thought I had located the trouble—a large filling in a superior right molar; I removed the filling and found I was half way right, because the pulp had become abscessed. He hadn't time to stay till treatment was completed, and I suggested to him that considering the immense amount of work his wife had of similar character to that which I had just removed, he consult with some X-ray man. I heard from him shortly after that the radiograph had showed on both sides of the mouth, upper and lower, a condition of latent abscess, or an abscessed condition in a quiet state, and upon proper treatment the trouble that she had had for the past five years, the most excruciating pain, was relieved.

Dr. F. L. Wright, Wheeling: I do not know better how I can discuss this paper than to relate two or three instances in which Dr. Quimby has helped me out. The first, a lady about 30 years of age, married, with a family. I first saw her six or seven years ago and she still retained the superior left cuspid, deciduous tooth. It loosened, and in about a year came out; we waited about a year, thinking the cuspid would come to place. It didn't. We had a radiograph picture made, and we found it lying almost at right angles above. We cut down through the gum, put a little screw at the end of the cuspid and, with the aid of rubber bands, twisted the tooth in place at the end of four months. Another case was an aggravated case of pulp stone. The tooth apparently was perfectly sound, but there was an aching on that side; very severe pains at night especially, and the radiograph picture showed a molar tooth with the whole pulp chamber almost filled with a pulp stone which, when removed, relieved the trouble. The other case was a superior left cuspid, permanent tooth, that abscessed, or slightly abscessed. I removed the dead nerve (this was five or six years ago), but I couldn't get any result; I couldn't get the thing quieted down. A radiograph picture showed a bifurcation of that cuspid root which, when properly opened up and treated, the trouble was relieved. I have the plate in my office showing the cuspid.

I want to say that Dr. Quimby's radiograph method has helped me out of several pretty serious difficulties, and I would not know how to get along without it. It is certainly a great advantage and a great boon to us, and also to the medical profession.

Dr. J. H. McClure, Wheeling: I will cite two cases where the X-ray has helped me: The first case was one of neuralgia. It was an impacted wisdom tooth. The lady was 25 years old. She had had neuralgia off and on for ten years, and had taken all kinds of dope; had gone to all the doctors in the community, and finally went to a surgeon, who looked at the tooth and suggested an X-ray. We took the wisdom tooth out. We had to take the molar out in front of it to get at it. But it cured the case.

I had one case some 12 or 15 years ago that went on to a very successful finish, and then broke through on the face. If we had had a picture of it, it never would have reached that state.

One case I would like to recount is a case of a malignant sarcoma, one of the spongy, quick growing kind, upon a patient whom I have had ever since I have been in dentistry. He was 45 years old, right at the age when those things develop—the most dangerous time. His family physician is a regular practitioner of medicine. He went to him first with neuralgia, the principal manifestation of it being right up on top of his head at the termination of one of the branches of the fifth nerve. He gave him all sorts of things to try. No results. Finally he came to me. I looked him over and I could not find a thing the matter with him except a molar tooth with an exposed nerve, and I thought, "That's it." I devitalized the nerve and cleaned it up, filled the root, and everything seemed to be in good shape. The tooth was not sore, never did get sore, but the pain in his head still went on from bad to worse. Finally it developed into a serious condition in the nose, and we sent him to a nose and throat specialist. He worked at him for possibly two weeks. Absolutely no visible showing on the face at all. Finally he came back to me, tho I had seen him nearly every day when going to the nose specialist, and I said to him, "Let's go and have a picture taken of this and see what it is," and we went. It showed the antrum on the right side full of something; we couldn't tell what it was. One was opaque and one was clear. Dr. Quimby, whose eye was more used to these things than the rest of ours, pointed these features out to us. We found that the antrum was full of something. I made up my mind to operate on it. I got his family physician to come to the office, and we gave him an anesthetic and started to trephine, but found the floor of the antrum almost gone. The tooth back of it loosened the next day, and about three days later there came down a mushy vascular mass. That was two days before Christmas. We kept it washed out until after the first of January, when he was operated on and the whole superior maxillary bone on the left side was taken out. They went so far up that the chisel even broke through the orbit of the eye. The doctors prophesied that he would be dead in six months, but he is getting along and they are treating him with the X-ray treatment. The diagnosis of that case was by the X-ray machine, and there was no visible appearance of it on the outside anywhere. It goes to show that in dentistry, in these occult cases, we can use it and we should use it.

Dr. J. R. Callahan, Cincinnati, O.: While I know practically nothing about this work from the technical standpoint, I do know that the radiogram is of the greatest assistance in the making of a proper diagnosis in many cases.

I remember a case of chronic alveolar abscess involving the right inferior cuspid tooth, a very simple case, apparently. I treated the case in the usual way, getting a favorable response at once. But in about two weeks the case returned, discharging freely. A radiogram showed that I had not opened or enlarged the canal at the apical foramen, just that minute portion of the canal where it passes through the cementum at the extreme *end* of the root—just where so many times we fail in root canal work.

Making a free opening into the fistulous tract solved this problem and the case has remained healed a little over a year.

A man about thirty years of age was suffering from an abscess of five years' standing in the region of the right inferior first molar. An effort to open the canals showed a nerve broach lodged in the lower third of the anterior canal; a radiogram showed that the broach extended through the root and into the process fully a quarter of an inch. Verily, some dentist must have driven that broach with a hammer. The radiogram showed further, that the process as far forward as the cuspid was infected, the family history of the patient being rather suggestive.

Those three teeth were extracted, the bone curetted and packed and taken care of a short time. There has been no recurrent trouble in two years. These two cases are sufficient to show the inestimable value of the radiogram in dental practice.

Dr. H. C. Brown, Columbus, O.: Dr. Quimby referred to one case, a patient of some forty-five years of age, who had had all of the upper teeth extracted and was wearing a plate, and this reminded me of a case which fell into my hands. This patient was sixty-six years of age. She had had, as she supposed, all of her superior teeth extracted several years before and wore a full upper denture. She had suffered for thirty-five or forty years, and had been treated for antral trouble, necrosis, etc., without result. She had been operated on twice, and at this time she had been told by the last physician that it would be necessary for her to have her superior maxillary, or that portion which was necessary, removed. She was assured that when this was done she could have some sort of a denture made that would restore the contour of her face. The lady was a resident of Washington, D. C., but was visiting in Indiana. Her physician directed that she go to Indianapolis and have a certain surgeon operate, but her daughter-in-law insisted that she go to Columbus. She chose a very capable surgeon, and before doing anything, realizing the condition and not being able to definitely diagnose it, he referred the case to an X-ray specialist. The plate showed a third molar occupying a position high up and out of the ordinary location. They called me in, and I removed the tooth, and the result was, as I expected, a very decided exostosed root. This patient left the hospital two or three days later and returned to her home in Washington. Some time after she wrote me that she was entirely recovered; had no bad after effects; her trouble that she had been suffering from all these years was entirely eliminated and she was enjoying the best health she had for many years. If that surgeon had not taken the precaution to have the X-ray used he probably would have gone ahead and removed that portion of the maxilla with the tooth embedded therein, and perhaps the tooth might never have been discovered until after the bone was removed. As I stated, she had had two operations and neither of the surgeons had ever discovered the tooth.

Dr. C. H. Steinbeck, Parkersburg: A patient came to my office with an inflamed condition of the mouth under a rubber plate he had worn several years. There was an enlargement in the anterior portion of the mouth that looked as though a cuspid tooth had been broken off and the gum had closed over it, but near the palatal portion there were two sinuses with some discharge, indicating necrosed bone. I advised an X-ray and we found an impacted cuspid tooth and some dead bone. These were removed and the tissues healed rapidly with the exception of one opening. Three weeks later we found another impacted cuspid tooth, this one lying in the palatal portion of the mouth. This was removed and the mouth conditions became normal again. Here the X-ray made the diagnosis positive.

Dr. Will A. Quimby, Wheeling, (closing): It seems that you all agree with me on this subject. As Dr. Wright says, the work speaks for itself. Just yesterday a dentist in my home town spoke of a porcelain crown he had put on in which he said the use of the X-ray had been most useful. He placed the cement in the cavity and the pivot was driven into place, and he thought the tooth was all right, but the next day the patient came back with a fistula, and some of this material (the cement) had gone through the foramen of the tooth and bored its way in through the gum, appearing on the labial surface in 24 or 36 hours.

One important point I omitted was that of dentists recognizing other conditions in the mouth than those to which their attention may be called. Since studying this subject I have been impressed with the importance of oral hygiene. A lack of it is frequently the cause of cancer in the mouth, that is, the uncleanliness and irritation. In this instance you learn to recognize it and refer the case. The tongue is not an uncommon site for lupus. Recently a case of this kind came under the observation of a nose and throat specialist. It was referred for diagnosis and treatment—is doing nicely under the rays. Syphilis is another disease having oral manifestations. I merely mention these to bring before you what any of you are liable to meet any day in practice.

A practical demonstration with a portable coil may throw a damper on your enthusiasm about the X-ray, because of the inefficiency of it as compared with a stationary coil; so you must not expect too much from the demonstration. If any one advises you to purchase a portable coil to use in your office, let them demonstrate that you can obtain satisfactory results on all teeth and parts of the alveolar processes. I have not satisfied my mind yet that rays from a portable coil will give results.

As you know, X-rays are dangerous; they will produce burns. In the hands of a skilled operator this agent is all right, but with the amateur it may cause trouble. Portable coils take a longer exposure, and the development takes great care and precision.

PRESIDENT'S ADDRESS.*

By J. H. McClure, D. D. S., Wheeling, West Va.

IT MAY be unseemly for one so young to indulge in reminiscences, but in looking back we observe that the advancement of dentistry has not been a sudden transition, but an evolution. The best efforts of the best minds in the profession have been given to the uplift of the craft as a whole, to the widening of its scope, to the betterment of its standing among its sister professions, especially medicine, and to an increase in the esteem in which it is held by the general public; until to-day we see the dawn of a new era, an era which places dentistry on a plane as high, if not a trifle higher, than any of the other specialties. This era of which I speak is the era of prevention, and prophylaxis is the talismanic word which, if properly directed, will raise it to such a height that it will begin to see the faint signs of the long-looked-for millenium.

Since the general adoption of the word "phophylaxis" by the dental fraternity a few years back, its mention has always produced visions of powdered pumice and sundry orange-wood sticks; but it has a much broader meaning. Any treatment or operation which will prevent disease or abnormal formation is prophylactic. Hence, orthodontia, in all its various ramifications, is prophylaxis. The removal of adenoids and nasal obstructions, and the like, are also included.

In China it is said the doctor is paid only so long as the patient stays well. In other words, he is paid to prevent disease rather than to cure it.

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*Read before the West Virginia State Dental Society.

"For ways that are dark and for tricks that are vain, the heathen Chinee is peculiar," but he is certainly very long on his theory. You may cure disease, but how many times there are results which are a blight to the individual all through life. Gentlemen, what I wish to impress at this time is the great opportunity which lies open before the dental profession. Never in its history has it had the chance to help itself, and at the same time benefit the whole race, that is offered by the theory of prevention. But how?

First, as an organized body we must put our shoulders to the wheel, endeavoring, in a large and general way, to educate and influence other organizations, among the principal of which are the medical, clerical and pedagogic. Of these classes the medical profession is probably the most important. In matters of hygiene the word of the doctor is mostly law, and we should lose no opportunity to present the cause of prophylaxis to our physician friends, that they may give it its due attention. The really successful medical man is a very busy individual. He has many worries, and many cases which are matters of life and death; but in most cases he has only to be shown the results of nasal obstructions, mouth-breathing and kindred evils to become the firm advocate and champion of our cause. And further, the physician is, more than anyone else, qualified to diagnose these malformations, provided he has given the matter any study; and it is up to us to see to it that he is enthused to the extent that he will equip himself so as to be able to recognize facial deformities when he encounters them.

The minister is a man of enormous influence. He is sent for in cases of sickness many times before the doctor is called. The educational possibilities of these men, going from house to house, superintending marriages, births and funerals, is enormous. The minister goes in time of sorrow and in time of rejoicing. He is intimately acquainted with the old, middle-aged and young, and can, by his advice and co-operation, start many a child on the road to physical perfection that otherwise would grow up into—who knows! a degenerate, or worse.

If this phase of duty could be fully explained to our clergy, singly or in association, I feel convinced that we could have their hearty and unqualified support; for, more and more, our ecclesiastics are beginning to realize that, if you would save a man for the next world, you must also save him and make a useful citizen of him in this present one.

I presume that of all the fields which we have open to our cultivation, the pedagogic world is the broadest and the most fertile. The possibilities of school teachers to observe the peculiarities of pupils from day to day enables them to see the more occult deformities, such as dull hearing, defective eye-sight, etc., which, by a casual observer, would be passed unnoticed. These symptoms are really the important ones, as they can be remedied before real malformation takes place. If our teacher friends can be instructed so as to be able to differentiate between a child whose gray matter is deficient and one who, from faulty breathing is unable to get proper sleep, or who, from imperfect lachrymal ducts or focus is unable to see, or who, from clogged nasal passages is unable to hear, the work of the instructor will be lessened, the reproach and punishment laid on many an innocent child will be mitigated, and the cause of health and humanity advanced. I firmly believe, from what experience we have had, that a mere suggestion of these truths to these ladies and gentlemen is all that will be needed to make them willing and anxious to give our ideas their earnest consideration and support.

But, you say, this is something of a contract. So it is, but "faint heart never won fair lady," and, as we are the apostles of this movement, we must "go forth into all the world and preach the gospel" of prophylaxis, where we can, how we can and when we can. If we really believe it and have our own hearts in it, it will be easy enough to convince others.

In Wheeling this winter we expect to organize an open campaign of education along this line, and have already taken steps to start the ball in motion. We will hold a public meeting with some competent lecturer as the star. The entire community will be invited, but especial inducement will be given the professional people, particularly the teachers and school boards, and we hope to see our feeble efforts crowned with success, "thirty, fifty and an hundred fold."

Gentlemen, we are brought into very intimate contact with our patients. We must talk about something. To some we talk stocks, to some grand opera, and we have been even known to discuss the prize ring and politics. "Out of the fulness of the heart the mouth speaketh." Let us engrave the word "prevention" on our intellects so that, it matters not what the subject of conversation may be, it will, as water runs down hill, gradually drift into our beloved hobby, and every patient who goes from our chairs will be thoroughly instructed, and men and women will, when they go forth and ponder what we have said, feel that they have received benefits other than professional services.

In conclusion, let me say again, never in the history of dentistry has the profession had the opportunity to do for itself what this great work offers. Time was when it was hard to differentiate between the watchmaker, the barber and the dentist. As years rolled by men arose who thought for themselves. Through their efforts and leadership the trade of "tooth-puller" was gradually elevated to a profession. Empiricism was eliminated and a more scientific foundation laid. We have learned, besides theory, to do things; to produce results. Let us now be broad enough, philanthropic enough, to give a little of our time and energy to the education of the public and to the salvation of future generations, and we shall see the banner of our beloved calling raised higher and higher, and across its folds will be emblazoned these words: "An ounce of prevention is worth a pound of cure."

REPORT ON ORAL HYGIENE.*

By J. F. Biddle, Pittsburg, Pa.

THE Oral Hygiene Section of the Odontological Society of Western Pennsylvania, was organized Wednesday, April 10th, 1910.

Resolutions were adopted for the governing of the body and an Executive Council elected for the purpose of forming plans to carry on the work of said section.

From the time of organization till July 1st, the Board conducted a campaign to secure additional members, sending application blanks to all members of the Odontological Society, many of whom they endeavored to see personally and urge their support. As a result of these efforts our present membership is but thirty-nine.

During the summer nothing was done, but in the fall the Executive Board submitted a plan to provide for the dental examination with suitable charts, etc. The resolution embodied the following features:

1. Communications to school boards requesting the privileges of preliminary examinations of school children's teeth in their sub-districts for the purpose of determining whether such examinations should become a custom.
2. Rules and requirements for examinations.
3. Charts and data for examinations.
4. Outline of work.
5. Blank forms for appointment of inspectors.
6. Application of parent or guardian for free dental services for public school children.
7. Outline for lecture course.
8. Communication to be sent to parents of children whose mouths are rated in fair or poor condition.
9. Instructions for examiner and teacher.

The Executive Board submitted plans to the Pittsburg Board of Health, with suggestions that the section do their work in conjunction with the Board of Health. The Director of said Board and Chief Medical Inspector took the stand that the medical examiners recently appointed were qualified to make dental inspection without the aid of dentists, but granted they would be very glad to see free dental dispensaries established where the dentist would volunteer to care for the charity cases submitted by said medical inspectors. After considerable discussion another conference was arranged but the Board of Health deferred action in the matter from time to time, giving no satisfactory answer, so that at length the section decided to act independently in the matter and secured permission of the proper authorities to make an examination of teeth of school children of the Fifth Ward, North Side.

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*Report of Secretary of Oral Hygiene Section of Odontological Society of Western Pennsylvania.

Monday, April 3d, 1911, the following members conducted this examination in the Fifth Ward School, the examination lasting from 9:30 to 11:45 A. M. and to be concluded Monday, April 17th, at the same hours: W. L. Fickes, G. C. Roll, J. F. Biddle, H. S. Hazlett, C. L. McChesney, Leslie Waddell, C. S. Cuden, C. C. Anthony, Pauline Horwitz, A. G. Copeland, Clara Marcus, F. R. Masters, H. W. Heckel, F. H. Wilson, Ga La Rosa, Klicka Rudolph, Frank C. Iams, R. M. Erwin, Emery W. Ferree, C. W. O'Hara, J. S. Ashbrook.

In order to give the Society some idea of the time required for such examinations, I quote from our reports as follows (one member examining, the other acting as recorder and filling out charts):

33 pupils, 6 examiners, 6 recorders, completed in 13 minutes.
27 pupils, 6 examiners, 6 recorders, completed in 11 minutes.
30 pupils, 7 examiners, 7 recorders, completed in 9 minutes.

Of the pupils whose mouths were examined by the twenty dentists on Monday, April 3rd, 1911, I quote as follows:

PUPILS UNDER TEN YEARS OF AGE

Number of pupils examined	208
Number of perfect mouths	10
Number of mouths ranked good	61
Number of mouths ranked bad	137
Number of pupils not using a tooth brush	165
Number of pupils having mal-occlusion	28
Number of pupils having nasal obstructions	24
Number of cavities in 6-year molars	258
Number of 6-year molars extracted	6
Total number of cavities	436

PUPILS OVER TEN YEARS OF AGE

Number of pupils examined	332
Number of perfect mouths	12
Number of mouths ranked good	107
Number of mouths ranked bad	213
Number of pupils not using a tooth brush	161
Number of pupils having malocclusion	139
Number of pupils having nasal obstructions	43
Number of cavities in six-year molars	673
Number of six-year molars extracted	163
Total number of cavities	975

The reason for considering the children in two classes, one under ten years of age, the other over ten years of age, is that a satisfactory average of cavities could not be reached in the permanent teeth exclusive of the six-year molars in the younger ones where most of the cavities are in the deciduous teeth, with the exception of six-year molars.

Special attention was directed to the six-year molar on account of its value to the child especially at the average of the children examined and also on account of its tendency to decay.

Regarding malocclusion, we found many of the conditions due to the retention of the deciduous teeth beyond their period of usefulness. In children ranging from 13 to 15 years, we found many deciduous teeth. In some cases from one to four had been retained; in several cases as many as six; and in one case seven. This one feature, alone, should convince the members of this society of the value and need of dental inspection to the coming generation. It is the desire of the Oral Hygiene Section that the members of this society shall consider thoroughly this matter and make some provision to support it. The movement needs your help, is worthy of it, and surely it would be to the advancement of our profession and to the betterment of the coming generation, if an active campaign were waged for this purpose.

This movement has been before the public for some time, much interest has been evinced, and the trend of public opinion is in its favor.

The section, of course, can do nothing without the support of this society. The Board has endeavored to conduct an educational campaign where we deemed it would do the most good. This last year, a series of articles on oral hygiene were published in the School Teachers' Bulletin and other journals of like character. The articles were written by the Chairman and Secretary of this Section, but were unsigned and no names mentioned. A number of lectures have also been given before educational and charitable organizations. This Section has also been asked to make examination of school children's mouths in two other schools in our city, but has deferred action until after this meeting. Our desire, therefore, is to know the wishes of the society regarding this movement. If this society pledges its aid, the work will go on, but if it goes on record as having no interest in the matter, the work involved is too great to be borne by a few and it would seem advisable to abolish this Section.

DISCUSSION

Dr. Fickes: Just a word in regard to this matter. Public school dental examinations are valuable for the reason of the psychological effect on parent and teeth. It is not so much the condition of the patient, but to store up in the minds of parent and child the value of the teeth. If that is not a vital matter for the dentists of these schools, I want to know it.

It seems to be a very remarkable state of mind on the part of those dentists in their opposition to this movement. And there has been opposition. I will state that the committee has received anonymous letters of a character that, if they had been submitted to the Post Office Department and traced to the owner, it would prove very serious for this man; would probably land him in the penitentiary for ten to twenty years. Furthermore, I personally have been called names which I do not care to repeat when I would ask a man to join this section. And, further, one or two of the members of this committee have been so unfortunate as to have their names printed in the papers. It is the policy of this section to have no names printed, particularly those taking a leading part in this movement.

There are two sides to this question. There is the philanthropic side, of interest to the public, and it is really a serious thing for a man to take part in this work, and those who are doing this work are in it for philanthropic reasons, and for no other. These men are unselfish or they would not be in it. There is nothing in it but criticism and knocks.

I would like to say a word in regard to advertising. I do not believe it is proper for a dentist to personally advertise, but as a profession we should let the public know of the importance of our work. Dr. Wheeler, in his paper, said we should go slowly until certain investigations in regard to the cause of immunity and susceptibility are completed. I think if we educate the public in the care of the mouth and teeth as far as we are able that we, in turn, will be stimulated to investigation and research in order to keep up to the greater responsibilities.

The medical profession receives large sums from the state and private bequests for research work. We, as a profession, have received nothing. This is so because our work on the mouth and teeth in their relation to public health is not appreciated at its true importance. The medical profession has numerous research laboratories in which they can carry on investigations at no personal expense, and in some of which the student receives a salary while carrying on his work. We have no such opportunities. If we wish to establish such laboratories we will first have to prove that our calling is worthy of consideration and that our work is of extreme importance in relation to the public health.

Dr. Flint: I am surprised that any man in the society would stoop to writing anonymous letters. I am heart and soul in for dental inspection in schools and have stated my reasons why, on a good many occasions. I believe a great amount of good can be done.

There are many people who want to take care of their children, but don't know what is happening to the sixth year molar. This public school inspection gives them an opportunity to learn about and to take care of their children as they will want to to do. Every man is going to reap benefit by advocating this movement.

Pennsylvania is behind other states in education and lots of other things. People in the southern states are taking this up and surging ahead.

Our society should give a vote of thanks to this committee and I trust will endorse the work that has been done so far.

PROVE ALL THINGS: HOLD FAST TO THAT WHICH IS GOOD.*

By J. D. Whiteman, D. D. S., Mercer, Pa.

ABSTRACT OF ADDRESS OF THE PRESIDENT

IN RETROSPECT of the past year it is notable that the trend of thought has been toward the rational application and perfection of prevailing methods and the determination of their worth rather than the introduction of new materials or radical innovations in methods and, indeed, if we will pause for a few moments to reflect on the rapid strides dentistry has been making during the last few years in both methods and materials and the failures which have resulted in their ill considered and irrational application, we will find almost if not quite enough to make us hope that this condition may continue for a time at least, that we may fully determine the real worth of the materials and perfect ourselves in the application of the methods we now have before further radical innovations in dental practice are thrust upon us.

The practice of dentistry has since its inception been characterized by a most remarkable devotion and enthusiasm of those engaged in it, and the eagerness with which each new method, material or appliance has been received and adopted is, of course, in a measure commendable, and has contributed largely to our progress. This whole-souled devotion cannot fail to impress one when attending one of our many large conventions or supply exhibits. Our dealers or manufacturers have but to announce that they will exhibit something new at a certain place and date, and we flock by the thousands, perhaps traveling several hundred miles to see and of course buy this new thing, and often at a personal sacrifice of which the general public has no conception. But has this progressive spirit always been conducive to the immediate advancement of our own or our patients' interests? Has not over-confidence in every instance on the part of the "faddist" or over-zealous caused the misuse and abuse of the new thing advocated, by members in the foremost ranks of our profession, and they in turn by the "lesser lights," done much to neutralize the value of what otherwise would have been a boon to ourselves and the public in general?

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*Read before the Odontological Society of Western Pennsylvania.

A little reflection on the past will be abundantly sufficient to prove that conservatism has been greatly needed, but deplorably absent in many stages, if not in every stage of dental development.

We will cite but a few cases in point:

The mere mention of celluloid is sufficient—the less said about it the better.

Then the gold crown; would not a vast majority of the teeth so restored have been better if skillfully contoured with either gold or amalgam, and with possibly a less percentage can the same not be said after a dependable porcelain crown was introduced, while the results of extensive fixed bridges have been so disastrous as to have been almost a calamity?

Few indeed are the cases where fixed bridges were employed and, as constructed, that a partial gold plate would not have served far better, and without the ruthless mutilation of sound, healthy teeth. Dr. Peeso has said that fully eighty per cent. of fixed bridges have proven absolutely useless and a large percentage of these, worse than useless.

Then shall we speak of the mummifying of pulps—perhaps it would be better for us all to forget that such a thing was ever suggested and pass on to and consider for a moment the porcelain inlay. This highest development of dental art, with all its virtues and possibilities, has not the alacrity with which we accepted it and its application by us, without stopping to consider its limitations or awaiting to perfect ourselves in its manipulation, almost condemned it entirely and produced a record of failures from an artistic standpoint as well as that of durability to almost equal any that have gone before?

And just now we are in the throes of another fad, that of the gold inlay. This kind of inlay, of course, has a wider and different field of usefulness than that of porcelain, being less fragile and admits of stronger anchorage. But it would seem that perhaps its greatest virtue, the fact that it can be inserted with so much less nervous strain to both patient and operator, may possibly be its hidden danger, *i. e.*, the attempt to apply it where not indicated. This would surely be calamitous, as such application will undoubtedly cause failure of the work and react on the operator by causing a degeneration in ability to manipulate gold foil. A great musician, when asked why he practiced seven hours on the piano every day, said, "If I fail to practice a single day, I notice it; in two days my friends notice it, and in three days every one can notice it." I doubt if anyone, by inserting only an occasional foil filling, can maintain the high degree of dexterity acquired by one who makes it a general practice. And permit me to say right here, that the gold filling is still as good as it ever was and is still abundantly entitled to rank first, and should still receive first consideration, other materials or methods to be employed only to meet special conditions.

The silicate cements recently introduced seem to be worthy of an important place in dentistry, especially in the teeth of the young. Yet the same dangers are here manifested as in the case of the gold inlay. The thought that I wish to convey is that conservatism was never more needed in the practice of dentistry than it is to-day. Indeed, it is unquestionable that a greater number of materials and methods brings with it an increased need for discretion.

It is true that our mistakes of the past have been but the price we have had to pay for our present development, but may a repetition of them not be largely avoided by giving preference to the true and tried wherever they are known to be dependable, resorting to the new only where the old has not satisfactorily met the conditions, and where other advantages are apparent than ease of manipulation, as permanence in results must ever be our first consideration as, after all, it is upon this that the real value of dentistry depends? "Prove all things, hold fast to that which is good."

I trust also that the foregoing will suggest the value of the little things, the apparent trifles and their importance to the future development of our profession.

The clinical feature of our meetings would be greatly enhanced if these little things of which every one has some store were all brought here and passed around as anything, however trifling it may seem, that has been of value to one will doubtless be equally so to others.

An incident is told by Michael Angelo, who, after the apparent completion of a statue, was seen returning to it every day, giving it an occasional touch here and one there, and after spending some days at this he was asked why he devoted so much time to these trifles, he replied, "they go to make perfection and perfection is no trifle."

A man works like thunder for twenty years so that he may build a mansion, and then finds that he was a lot more comfortable in a cottage.

DENTAL LAWS.

By Alfonso Irwin, Camden, N. J.

(Continued from Page 597, August Summary)

THE VIRGINIA LAW

Again we urge the incorporation of the "maintenance-of-standards" clause in our dental laws, upon the part of the dental colleges. It is far more imperative than the M. D. requirement recently introduced into the Virginia Dental law.

If any state wants to introduce a new feature in their law let them incorporate a maintenance-of-standards clause with appropriate penalties attached for violation thereof.

THE M. D. REQUIREMENT

In view of the fact that the Carnegie Foundation has discovered that ONLY one-fifth, or "thirty odd," out of one hundred and fifty-five medical colleges are maintaining *standards,* the value of the qualifications of the Virginia applicant for a license to practice dentistry is not particularly enhanced by the possession of the degree of M. D., especially when we consider the standing given the medical schools of the *South* (Maryland, Kentucky, Tennessee, Texas, Arkansas), as described by Abraham Flexner, the expert who examined the Medical Colleges of the United States and Canada, and reported to the President of the Foundation, Dr. Henry S. Pritchett. The *Foundation* also discovered that there were four times as many physicians as were needed in the United States, the majority of whom are ill-fitted to practice medicine. Virginia will doubtless reap the benefit of this surplus, as some of these medical men will take advantage of the new law to obtain a license to practice dentistry. The discoveries of the Carnegie Foundation for the Advancement of Teaching have a familiar sound, for we discovered a similar condition of affairs amongst dental colleges several years ago, through the process of tabulation.

The successful completion of the medical course is desirable, and if rightfully used should prove helpful, but we fail to see how it will make better dentists. Moreover, it is imitating the most questionable provision of the dental laws in Europe, whose M. D. dentists are no better than the D. D. S. dentists. The state imitating Austria, Belgium, France, Hungary, Russia, Italy and the Netherlands, complicates the fifty-two dental laws of the United States without improving the laws any. We have defects enough in the dental laws of this country without importing them from abroad.

THE MICHIGAN LAW

In examining the dental law of Michigan (June 28th, 1907), we are surprised at two things:

FIRST: The completeness of some of the provisions contained therein and the importance of some *things omitted.*

We suggest that Section 2 should be amended as to the Appointment of Dental Examiners.

Upon examination of the Dental Laws of the United States we find that the Governors appoint twenty-nine Boards; the Governor appoints nineteen Boards upon the recommendation of the State Dental Society; three Boards are appointed, one by Commissioners, one by Regents and one by a Board of Health; while fifteen Boards are appointed by the Governor with advisors, such as the Senate or the Council. State Societies recommending the appointment of dentists for members of the dental examining boards are Alabama, Arkansas, Colorado, Georgia, Florida, Indiana (3), Iowa, Kentucky, Maryland (9), Minnesota (3), New Jersey, New York, Pennsylvania (12), (twice the number which is to be appointed), South Carolina, South Dakota, Virginia, Wisconsin, Hawaii We claim that in the most intelligent and progressive states in the Union the State Dental Society recommends the appointment of the examiners to the Governor, and we hope that the state of Michigan will become the twentieth on the list.

MICHIGAN

Section 3a is an excellent provision, which should be included in the dental laws of all countries, but in the second clause of Section 3 we would like to see substituted the following subjects:

College Curriculum, Anesthetics and Anesthesia, Anatomy (Practical and Theoretical, including Dissection of the Head and Neck), Comparative Odontology, Chemistry (Organic and Inorganic with laboratory course), (Bacteriology, Biology, Embryology), (Dental Ethics and Jurisprudence), Physiology, Histology, Materia Medica, Therapeutics, Dental Metallurgy, Orthodontia, Dental Pathology, Operative Dentistry, (Prosthodontia, Crown and Bridge Work, Oral Prophylaxis). This roster of subjects should be studied especially in their relation to the teeth, in our dental colleges.

It appears to us that anesthetics and anesthesia are the most important subjects in the whole college course, and should receive attention from the most skilful experts and teachers. We are utterly baffled in our efforts to discover why the most responsible branch in the whole range of dentistry, which treats of operations where the dentist holds, as it were, the *issue* of life or death in his hands, should be relegated to a very indefinite position, or entirely ignored, as it has been, in this section.

MICHIGAN LAW

Anesthetics, Anesthesia, Dental Jurisprudence, Comparative Odontology, Oral Prophylaxis and Oral Bacteriology (particularly syphilitic and cancerous infection), not to mention the twenty pathogenic germs that find ingress and egress through the mouth, appear to be slighted in some dental colleges. It is amazing to what extent these branches of dental science are neglected.

Some time ago we were informed by Dr. S. B. Luckey, President of the New Jersey Board, that one of the leading colleges in this country had only three lectures delivered in three years upon the subjects of Anesthetics and Anesthesia, and these lectures were delivered by a sub-lecturer upon a Saturday when the attendance of the students was not compulsory. Through the efforts of the New Jersey State Board of Registration and Examination in Dentistry, attention to this state of affairs was directed, the Faculty pledged themselves to deliver a specified number of lectures upon regular dates and stipulate that attendance by the students upon these lectures should become compulsory for graduation.

SECTION 3. Further along in the same paragraph in line 32, we would suggest forty weeks "of six days for each session" during each of the three consecutive years substituted for "not less than thirty-two weeks of six days for each session." One hundred and twenty weeks of six days each is short enough time to prepare a man, when we consider the marvelous improvements that have been made in the practice of dentistry and the increased number of studies and specialties.

We should also suggest the following paragraph: "And shall require its matriculates to have a preliminary education, consisting of graduates' certificate of a full four years' course of an *approved* High School, or *entrance* requirements into your State University." The wording of this part of Section 3 seems to be somewhat imperfect. There are four classes of High Schools; the *approved* (four *years*), constituting the highest grade in the United States. This High School is "*approved*" by your State Board of Education.

NOTE.—It includes, after four years' course of study in the Grammar School, orthography, reading English, Grammar, Geography, United States History, Elementary Civics, Drawing, Practical Arithmetic, Science Lessons, Singing, etc., four more years in the study of the following subjects: Mathematics, Algebra, through quadratics and progressions; Geometry, plain and solid with original work; Physics, a year's course, with experiments by teacher and laboratory work by pupils; Chemistry, a year's course with experiments by teachers and laboratory work by pupils; Physiology and Hygiene, with direct reference to physical training; Bookkeeping, Commercial Law, Botany, five months, including work with plants; Zoology, General History, Greek, Roman, English, American languages; Latin, Cæsar, Cicero, Virgil; Greek, Anabasis, Iliad; German or French college requirements.

ORTHODONTIA

Orthodontia has developed into an exceedingly important specialty of dentistry. Insanity, chorea, cancer, epilepsy, neuralgias, septicaemia, have been caused by *impacted* teeth. The far-reaching influences exerted by malposed teeth, irregularities of the maxillæ and their consequences local and systemic, are so potential that we do not see why this branch should be left out of the college curriculum, required in Section 3, paragraph 2, of the Michigan Law.

ORAL PROPHYLAXIS

We substitute the word "Oral Prophylaxis" for the vague, indefinite term "Hygiene." It is a specific term and an educated man knows what is referred to when we use this phrase. It is also our opinion that the subject of Oral Prophylaxis is destined one day to become a basic principle, upon which the dentistry of the future will attain its highest value to humanity as a science. Prophylaxis is scientific dentistry; conversely stated, scientific dentistry is prophylaxis.

BIOLOGY

The importance of biology cannot be overrated. It is essential to a scientific education and is absolutely necessary to the intelligent study of bacteriology. Bacteriology is the *basis* for the new dentistry, or preventive treatment.

MICHIGAN LAW

Section 5 of the Michigan Law needs rewriting (See 15th line) thus: "The examination may be written, or oral, or both, at the option of the said Board, and shall include the following subjects: Anatomy, Anesthesia, Bacteriology (Biology and Embryology), Chemistry (Comparative Odontology), Crown and Bridge Work, Histology, Materia Medica, Metallurgy, Oral Prophylaxis, Oral Surgery, Operative Dentistry, Orthodontia, Pathology, Prosthodontia, Therapeutics." These are the subjects recommended by the National Association of Dental Examiners, but we add Biology, Embryology, Dental Ethics and Jurisprudence, also Comparative Odontology, to this list.

COMPARATIVE ODONTOLOGY

It has not been many years since Chicago courts and lawyers raked the dental profession "fore and aft" as a scientific body of men, because of their ignorance of the dental organs of beasts, referring particularly to the rodents and domestic animals. The worst part of the arraignment was that the criticism was true. Some colleges are amply provided with instruction and equipment for imparting information upon the subject of Comparative Odontology, but we believe that dental examiners should have given this branch attention long ago in holding their examinations.

RE-REGISTRATION

We suggest in Section 6, line 33, after the word "re-registration," "all dentists practicing in the state of Michigan must register his, or her, name, address and credentials annually thereafter before December 31st of each year with the Secretary of the Board of Dental Examiners, before a license shall be re-issued to such applicant, in order to continue to practice dentistry legally in this commonwealth." Failure to do so after ninety days' written notice will work revocation of license.

MINOR PROVISIONS

We recommend to your favorable consideration the following clause, which is a reproduction of a provision in the dental law of New Zealand (1904).

"No dentist shall be liable, while in actual practice, to serve on any jury."

ANNUAL REPORT

Above all, do not fail to insert a clause providing for an annual report to the Governor, including a brief, though complete, account of the year's work, the names and addresses of all legal practitioners, and a statement of the moneys received and disbursed. Upon written request a copy of this report should also be furnished to each dentist in the state.

We have examined over one hundred dental laws in force throughout the world, and there is not a single one that we can present for your consideration as an ideal Dental Law. Each one has some equitable provision of a striking character, desirable in one country, which might prove *useless* in another. All have some defect, but the influence of each law considered as a whole is beneficial and wholesome for that people to whom it is applicable. It is open to you gentlemen to devise and enact the *model* dental law for all states to copy from, which the lawyers cannot tear to pieces, the courts ignore, or the jurors repudiate.

As your law now stands, excluding the faulty sections referred to, after examining the dental requirements of about one hundred and thirty states and countries, we believe it is far superior to many state Dental Laws.

CONTROLLING HEMORRHAGE IN SETTING CROWNS AND BRIDGES

By J. E. Argue, Red Lake Falls, Minn.

In irritated conditions where the gums have a tendency to weep and bleed, treat the gum margin with a 15 per cent. solution of Trichloracetic acid. I know of no other astringent that so absolutely controls such a condition in setting crowns and bridges and inlays, and at the same time having such a curative effect.—*Dental Review.*

STERILIZATION OF WAX

By Thomas Fletcher

Wax may be sterilized and rendered fit for further use by boiling it for thirty-five minutes in a large pan of water containing one ounce of oxalic acid to the quart.—*Pacific Dental Gazette.*

CORRESPONDENCE

THE HIGH MORTALITY FROM ETHYL CHLORIDE.

By Stewart J. Spence, Chattanooga, Tenn.

IN the *Therapeutic Gazette* of May 15, 1911, is an article entitled, "The Comparative Danger of Ethyl Chloride as an Anesthetic," from which the subjoined extracts are made:

"In this paper Miller presents the statistics on 43,796 anesthesias with ethyl chloride, in which there were five deaths. Miller, from his statistics, places the mortality from ethyl chloride anesthesia at 1 in 8,800 cases."

"McCardie presents statistics of 9,711 cases with four deaths of which he was cognizant."

"By adding together Miller's and McCardie's statistics we have 51,507 cases with 9 deaths, a mortality of 1 in 5,700."

"Of 22 deaths reported by Luke, eight were in dental cases."

"Miller points out that the danger signals in ethyl chloride anesthesia are such as may be easily overlooked by any except the most experienced anesthetist."

"Another element of danger which comes to light. . . . is the extraordinary suddenness of the end. To the great majority of cases death has occurred from an anesthesia of less than five minutes."

"The freedom with which this drug is being employed by unexperienced and untrained persons, with the idea that it is practically as safe as nitrous oxide, is little short of criminal. . . . This practice, in the author's belief, is one which the medical profession should strongly condemn. . . . Such considerations (as its superior portability) should not be allowed to stand for a moment against the fact that ethyl chloride is about 200 times as dangerous as nitrous oxide."

NOTICE TO SCHOOL INSPECTORS.

The Ann Arbor Board of Education has appointed a public school dental inspector on salary. Similar inspectors have been appointed at other places having similar duties. In order that these officials may be brought into communication with each other for their mutual benefit and the improvement of their service, it is requested that all public school dental inspectors send their names and addresses to THE DENTAL SUMMARY at as early a date as possible.

Names and addresses should be addressed to Dr. L. P. Bethel, 1255 Neil Ave., Columbus, Ohio.

WHY DENTISTS DO NOT ATTEND DENTAL SOCIETY MEETINGS

Dear Doctor Bethel:

I have just found time to read in the June number of THE DENTAL SUMMARY your editorial, "Be a Live One," and I feel prompted to mention two reasons that help to discourage *me* from attending dental meetings: First, there is too much time "fooled away" by meeting, or beginning the different numbers on the program, from a half hour to an hour later than the time set in the program.

Second, the clinics are not conducted so as to benefit the greatest number who would like to see them, for the reason that the clinician has a *few* crowded around him as closely as they can get, who, like the end seat hog, get there first and *stay* there to the exclusion of others, and scarcely leave the clinician room to demonstrate his subject.

I can not understand the necessity for tolerating either of these nuisances. Do the dentists managing dental meetings conduct their own practices as they do the meetings, by setting an hour for a patient and then be ready for them a half hour or more later than the time set?

A clinician should have a railing or fence around him sufficiently strong to protect him and leave space enough for him to work, as well as to accommodate a greater number of observers. Yours truly,

D. S. THOMAS.

THE RECENT MEETING OF THE NATIONAL DENTAL ASSOCIATION

The meeting was one of the best attended, if not the best, of any meeting yet held, the total registration being more than three thousand.

The general sessions and section meetings were well attended, and some valuable papers were read. The literary program, however, was so long and some of the papers so voluminous that several essays had to be read by title, and general discussions limited. In order that this may not occur again the Executive Council recommended and the association adopted a resolution limiting the papers to thirty minutes, the opening discussions to ten minutes, and general discusser to five minutes. It was also decided to hold the clinic on the last day of the next meeting, that additional time may be given the literary program.

One of the most important actions taken at this meeting was with reference to the revision or reorganization of the Association. In accordance with a resolution passed at the Denver meeting the Revision Committee was authorized to invite representatives from the National Dental Organizations and the various State Societies, to meet with the committee for the purpose of ascertaining the general sentiment relative to this much discussed subject. The committee arranged for this meeting to be held in Cleveland, commencing at 9:00 A. M. July 24th, and invited representatives from the above named organizations to meet with them.

Twenty-four representatives were present and a full and free discussion of the subject followed. At the conclusion of the discussion and on motion, with only one negative vote, these representatives expressed themselves as favoring a plan of rorganization along the lines of the American Medical Association.

The Revision Committee, in accordance with the sentiment thus expressed, made such necessary changes in the copy of the constitution presented at the Boston meeting and reported same to the Executive Council and they recommended it to the Association, where it was approved as a general plan of reorganization. The committee did not attempt to present by-laws, but same will be prepared in conformity with the Constitution and will come up, together with the approved Constitution, for the adoption at the next meeting, the same to become effective the year following, that is, in 1913.

Such "State and Territorial Societies that have, or which hereafter may, become organized in conformity with the general plan of the National Dental Association, and which have declared their allegiance to said National Dental Association, and which shall agree to the formation and perpetuation of the House of Delegates, shall be recognized as Constituent Societies. Each Constituent Society shall maintain a membership in this Association equal to two-thirds of its own membership." The annual dues will be $2.00.

The clinical program consisted of 306 clinics, which were divided into two morning sessions. This was probably the largest dental clinic ever presented, and much benefit was derived by many through the practical demonstrations at this meeting. The Clinic Committee is to be congratulated.

The local entertainments for the ladies and dentists was elaborate and greatly appreciated by all. The local committee deserves praise for the results of their great work.

Washington, D. C., was selected as the next place of meeting, and the second Tuesday of September, 1912, the date for same.

The following officers were elected: President, A. R. Melendy, Knoxville, Tenn.; Vice-President from the South, L. P. Dotterer, Charleston, S. C.; Vice-President from the West, D. O. M. LeCron, St. Louis, Mo.; Vice-President from the East, L. L. Barber, Toledo, Ohio; Corresponding Secretary, Charles W. Rodgers, Dorchester, Mass.; Recording Secretary, H. C. Brown, Columbus, Ohio; Treasurer, H. B. McFadden, Philadelphia, Pa. Members of the Executive Committee, J. D. Patterson, Kansas City, Mo.; C. J. Grieves, Baltimore, Md.; Victor C. Jones, Bethlehem, Pa. Executive Council, H. J. Burkhart, Batavia, N. Y.; Charles McManus, Hartford, Conn.; A. H. Peck, Chicago, Ill.; E. R. Warner, Denver, Colo., and B. Holly Smith, Baltimore, Md.

THE DENTAL SUMMARY

The Magazine That Helps

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The Ohio State Dental Society
The Michigan State Dental Society
The Indiana State Dental Society
The Kentucky State Dental Society
The Louisiana State Dental Society
The West Virginia State Dental Society
The Northern Ohio Dental Society
The Northern Indiana Dental Association
The Eastern Indiana Dental Society
The Southwestern Michigan Dental Society
Odontological Society of Western Pennsylvania
The Lake Erie Dental Society

and Several Local Dental Societies

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REGULAR CONTRIBUTIONS

ANCIENT ORIGIN OF DENTAL CASTING

By L. W. Strycker, New York.

THE object in preparing this article is not to change public opinion nor to bring discredit upon anyone. Rather is it to enlighten the dental public upon a subject concerning which much erroneous information is extant, in the hope that others may take up the subject and work it out for the benefit of all, as did the Old Masters in an age when time was nothing and art everything.

The facts herein laid before the public have been gained by the study of old text-books as well as from the references to current authorities that are given. Being in possession of this knowledge, the writer looks upon it as his duty to give it out. By withholding it, he would lay himself open to the charge of secretiveness, and bring dishonor upon himself in later years.

Of course, only the most brief outline can be given in such an article. Any attempt to print all of the valuable information that has been gained by this investigation would be entirely out of the question, as volumes would be required to reproduce it. The books themselves should be read by every man who is interested in the subject sufficiently to take the time necessary. For those who have not the time at their disposal, this brief resume has been prepared, and is here offered for what it may be worth to the profession.

The most cursory investigation of the authorities given will convince any man that casting by the so-called "modern" processes is by no means new; that it is simply a neglected and almost forgotten art. In taking up the subject we must go back to the most ancient text-books and records, the older the better. The methods that we are now so eager to learn are handled by the Old Masters in the founding art with most satisfactory clearness and particularity of detail. Especially is this true of the "Cire Perdue" or disappearing model or "wasting wax" process, which was known and in common use almost countless ages ago.

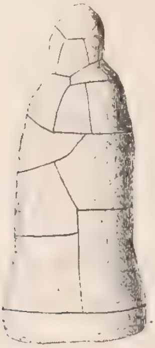

Fig. 1—"Malaga a la Francaise" or piece casting. The model completed.

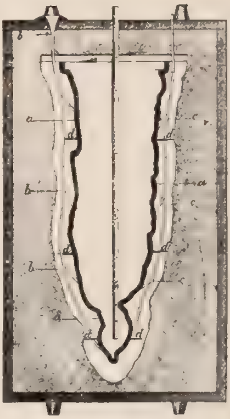

Fig. 2—Piece casting: the model "inverted."

This also is true of two of the methods for forcing the metal into the mould in common use today—centrifugal force, and pressure. The centrifugal method is first mentioned in the old books, and we reproduce an illustration of one of these ancient centrifugal casting machines on page 671. This was used for casting bronze busts and other objects of art.

Later the air-pressure machine was invented and became well known. A cut is given of one of these ancient devices on page 673.

The earliest account of the casting of bronze by the cire perdue or disappearing wax model process is given in *Knight's American Mechanical Dictionary* as 2230 B. C., and has to do with a reference by Herodotus and Diodorus to massive bronze statues that were set up in the Temple of Belus, in Babylon.

In Isaiah, xliv, 12, written about 712 B. C., is an account of the making of the golden calf by Aaron, supposed to be several centuries earlier, or about 1491 B. C. "He," Aaron, "received then the golden ear-rings of the people at their hands, and fashioned it with a graving tool, after he had made of it a moulten calf."

The Colossus set up by Nero the Roman emperor, before his golden house, near the site of the Temple of Venus at Rome, was a bronze figure of himself, the work of Zenodorus. This also was cast by the cire perdue, or disappearing wax model process.—*Knight's American Mechanical Dictionary.*

Myer's Ancient History tells us that bronze was cast by the Greeks about the eighth century B. C., which also speaks of Lycippus as being renowned for his works in bronze.

This knowledge, that the ancients were in possession of the greatest skill in the art of casting metals, lets a flood of light in upon some of their most famous productions now preserved in museums. Until this was learned concerning them, the wonder was how such marvelous reproductions could have been made with the crude methods supposed to be at their command. The use of the disappearing wax model, invested and cast upon a large scale, it is true, but in precisely the same manner as that now employed in dentistry, makes all that clear.

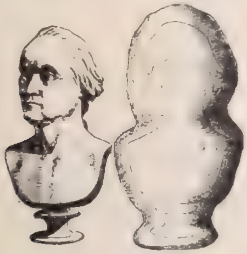

Fig. 3—"Cire Perdue," or Waste-Wax Method. Identical with Modern Disappearing Model Methods.

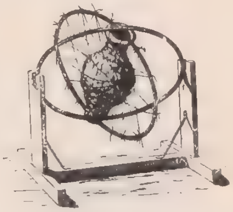

Fig 4—Ancient Centrifugal Casting Machine. Date unknown.

"The great bronze lions of the Nelson Monument in London are a sad example of the present low state of the founder's art. Coarse sand casting in England now takes the place of the delicate cire perdue process."—*Encyclopedia Brittannica,* Vol. 14, page 79.

"The full-length recumbent effigies of Henry III and Queen Eleanor at Westminster, cast in bronze by this process (disappearing wax model method) are equal, if not superior, in artistic beauty to any sculptor's work of the same period." (End of the thirteenth century.)—*Encyclopedia Brittannica,* Vol. 14, page 77.

"The great candelabrum in Seville cathedral is the finest specimen of sixteenth century metal work in Spain. It is mainly the work of Bart Morel, in 1562. It is cast in bronze, enriched with delicate scroll-work, foliage and numbers of well-modeled statuettes, cast by the disappearing wax model method.—*Encyclopedia Brittannica,* Vol. 14, p. 76.

"In Work-shop Receipts," published by E. Spon, London, page 221, is described the two methods of wasted-wax casting: "Malaga a la Francaise" or piece casting. (See Figs. 1 and 2.) The other process is that known as cire perdue, or waste-wax pattern. It is the more ancient of the two and has been practiced from time immemorial by the artists and artizans of Italy." (See Fig. 3.)

"The mention of moulds for the casting of wax figures is ascribed to Lysistratus, about 328 B. C."—*Knight's American Mechanical Dictionary,* Vol. 2, p. 1459

"Suppose a small ornamented vase were to surmount the pillar; the founder would prepare the pattern for this in a more elaborate manner. He would first mould it in *wax.*"—*Chambers' Encyclopedia,* Vol. 4, p. 454. Published 1870.

"An old method which is still employed in Italy is to make a core composed of potter's clay, brick dust, cow's hair or some other composition, and over this to model the figure in *wax;* then the other mould is formed on this of some composition of which loam is the principal part. The whole is then dried and baked, in an oven, *until the wax is melted and cleaned, and the mould is rendered sufficiently porous.*"—*Amn. Cyclopedia,* Vol. 4, p. 85. Published 1875. (The italics are mine.)

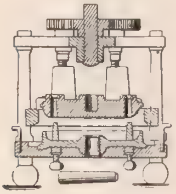

Fig. 5.—Pressure Casting Machine, about 1819.

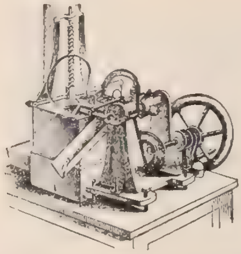

Fig. 6—Type- Casting Machine. Casts by pressure.

"Castings of *great delicacy* are produced by using models of *wax.* These are embedded in moulds of finely-ground earth, which are then heated *red hot.* The mould is baked and THE WAX DISSAPPEARS; and the metal, when poured, exactly takes its place."—*Knight's Amn. Mech. Dict.,* Vol. 1. Published 1880.

The most clearly written directions for using the disappearing wax model method are given on page 72, vol. 14, *Enc. Brit.,* published in 1891, by R. S. Peale Co., Chicago. These directions were reproduced almost word for word, sufficiently so to warrant the assertion that they are identical, in the first directions given to us for the casting of inlays and the like; particularly where we are told to "use an investment mixed with water to the consistency of cream, and apply with a brush, until a coating is formed over the wax," etc. Here is the quotation:

"METHODS OF MANIPULATION IN METAL WORK.

"Gold, silver and bronze may be treated in various ways, the chief of which are (1) casting in a mould, (2) treatment by hammering and punching (swaging; French repoussé). The first of these, casting, is chiefly adapted for bronze, or in the case of more precious metals, only if they are used on a very small scale. The reason for this is that a repoussé relief is of such thinner substance than if the same design were cast, even by the most skilful metal worker, and so a large surface may be produced with a very small expenditure of valuable metal.

"Casting is probably the most primitive method of metal work. This method has passed through three stages, the first being represented by solid castings, such as are most celts and other implements of prehistoric times; the mould was formed in clay or stone, and the fluid metal was poured in until the hollow was full. The next stage was, in the case of bronze, to introduce an iron core, probably to save needless expenditure of the more valuable metal. The British Museum possesses an interesting Etruscan or archaic Italian example of this primitive device. It is a bronze statuette from Sessa, on the Volturus river, about two feet high, of a female, standing, robed in a close-fitting chiton. The presence of the iron core has been made visible by the splitting of the figure, owing to the unequal contraction of the two metals.

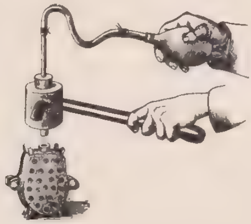

Fig. 7—Dr. Carroll's Air Pressure Casting Machine, 1885-6.

"The third or last stage in the progress of the art of casting was the employment of a core, generally of clay, around which the metal was cast in a mere skin, only thick enough for strength, without waste of metal.

"The Greeks and Romans attained to the greatest possible skill in this process. Their exact method is not certainly known, but it appears probable that they were acquainted with the process now called cire perdue (wasting wax method), the same as that employed by the great Italian artists in bronze, and *still unimproved upon, even at the present day.* Cellina, the great Florentine artist of the sixteenth century, has described it fully in his *Trattato della Scultura.* If a statue were to be cast, the figure was first roughly modeled in clay, only rather smaller in dimensions than the future bronze; all over this a skin of wax was laid and worked by the sculptor's modeling tools to the required form and finish. A mixture of pounded brick, clay and ashes was then ground finely in water, TO THE CONSISTENCY OF CREAM; and successive coats of this mixture were then applied *with a brush*, until a second skin was formed all over the wax, fitting closely into every line and depression of the modeling. Soft clay was then carefully laid on to strengthen the mould, in considerable thickness, till the whole statue appeared like a shapeless mass of clay, around which *iron hoops* or *rings* were bound to hold it all together.

"The whole was then thoroughly dried and placed in a hot oven, which baked the clay, both of the core and the outside mould, AND MELTED THE WAX, which was allowed to run out through small holes made for the purpose. The mould was now ready for casting," etc.

So here we have a fairly accurate and connected history of THE DISAPPEARING PROCESS, and will next take up casting machines in the use of which pressure was employed.

Our cut, Fig. 4, shows a primitive centrifugal machine, used for casting a bust.

Knight's Amn. Mech. Dict., Vol. 1, published 1880, says: "In the English patent, No. 3197, January 28, 1809, the moulds for casting are upright and are made to revolve on pivots or spindles. The centrifugal force causes the metal to fill up all parts of the mould." It also says: "In an American patent of 1857 the car wheels are revolved (while being cast) so that the first metal poured is made to form the tread of the wheel, and the second portion to form the body of the wheel"; and further: "In Bessemer's patent the metal is poured into fast-revolving cylinders, the rapid rotation of which causes the metal to collect on the inside of same, when it is allowed to cool. It is then split open and rolled."

The same volume then speaks of pressure casting machines. "To obtain the best results in compact metal castings, destitute of porosity, and with sharp definition on the angles and ornaments, casting under pressure has been devised. See Hollingrake's English patent, 1819."

Following this it gives a drawing of the machine, which we have reproduced as Fig. 5. Going farther, it says:

"In one case the moulds are so arranged that the top part serves as the follower of a press, and is operated on by screws. The top part fits closely into the matrix and is provided with ingates for the metal, which are closed by slides when the mould is full. The *pressure* is applied to the metal while in a melted state, with *sufficient force to expel the air* and *gas from and solidify* the *metal.*"

Then it speaks of Smith's process of compressive casting. The face of the article is covered with a preparation of potter's clay, the model is withdrawn by a little india-rubber suction apparatus, "and we have an exact fac simile, ready, when dried, to be cast from. Nothing can exceed the beauty of the result by casting the metal under pressure in the mould. Thus prepared, screws and nuts which never had a tool put on them, leave nothing to be desired in the way of accuracy and completeness."

On page 604, describing the term "compression-casting," we find this: "A mode of casting bronzes, etc., in moulds of potter's clay, under a pressure which causes the metal to flow into the delicate tracery left by the pattern. This work nearly approaches the work of the graver and chisel.

It is especially used in casting house-builders' hardware, letters, numbers for houses, etc."

In Vol. 2, page 1462, is the following: "Soft and perishable objects may be so moulded as to produce a single casting by one of the several following methods which are adapted to the procuring of castings of small animals, insects, flowers, feathers, ferns, sea-weed, wax models, etc.:

1. Support the object in the center of a small box, by needles; one or two should be sufficiently large to form ingates. Fine river mud is dropped into the box and shaken around so as to adhere to the object. When partially dry, a coarser grade of silt is thrown in until the box is filled. The needles and ingate wires are withdrawn, the mould burned to reduce the object to ashes, which are shaken or blown out, when the mould is ready for casting.

2. Another method is to take the object itself or a *wax model*, such as that of a flower, and suspend it in a box while plaster of Paris is carefully poured around it. The application of heat causes the object to burn *or the plaster to absorb the wax;* or, if the latter be in excess, it may be poured out. The strings by which the object was suspended are withdrawn and the mould is ready for casting. This plan was adopted in casting the feather of the equestrian statue of George III, at Pall Mall, London; and specimens of ears of wheat, flashy flowers, such as coxcomb, and other beautiful objects."

We are indebted to the Italians and French of the fifteenth, sixteenth and seventeenth centuries for *safe* moulds; the ones mentionad above are termed waste moulds.

On page 2312, Vol. 3, this work describes the casting of busts and statuary. The print is very fine and the article would fill a single issue of any of our dental journels. The article was written in 1844.

The description in part follows:

"The present system of statuary casting is as follows:

1. Take a cast in plaster sections, which together form a matrix.
2. Cover the inside of these sections with a *shell of wax.*
3. Place the sections together so as to form a mould.
4. Fill the inside with clay or slush, so as to form a core with supports to sustain it independently of the mantle.
5. Remove the plaster sections, *the wax adhering to the clay.*
6. Work up the wax surface into complete form by hand.
7. Coat with porous clay composition to form mantle.
8. *Bake in a furnace, melting or burning out the wax.*
9. Run the metal into the baked clay mould.

The church of St. Isaac at St. Petersburg is decorated with a large number of statues and figures in relief obtained by this process."

On pages 2674-2675, Vol. 3, the type-casting machine is described, showing the Bruce machine, and says that in 1850 a French invention by

M. Didot was designed to cast about 200 types at once, requiring about twenty seconds. Pressure brought to bear upon the molten metal forced it into all the recesses of the moulds.

Westcott's machine, U. S. patents 115, 796, June 6, 1871; 169215 and 169216, October 25, 1875, casts and sets the type by pressure on the molten metal.

In the *American Cyclopedia*, Vol. 13, p. 791, published in 1875, we find the following: "There are difficulties in making large, thin vases, which have been overcome at Sevres by the employment of atmospheric pressure and exhaustion. A plaster mould is used, and the cast is made either by covering the mouth of the mould and forcing air into the interior, or by exhausting the air through the porous plaster by means of an exterior air-tight case."

The Century Dictionary and Cyclopedia, Vol. 1, p. 849, published 1889, in describing the meaning of the words "Compression Casting," uses these words: "A method of casting in moulds of potter's clay, with sufficient pressure to force the metal into the most delicate tracery left by the pattern. It is used in casting letters, stamps, house numbers, house builders' hardware, etc. Further on it defines the meaning of the words "Casting Press" as "a press in which metal is cast under pressure."

Chambers' Encyclopedia, Vol. 9, p. 606, published 1870, says that various attempts were made during the early part of the century to cast type by machinery, but that the first successful type-casting machine was invented by David Bruce, jr., of New York, and patented March 17, 1838.

The first type-casting machine was patented in the United States in 1828 by William M. Johnson, but it did not produce good types. The patent was sold to George Bruce, and the machine was used by him until 1845. David Bruce meanwhile patented another machine, 1843, with improvements two years later, which gave entire satisfaction and is now in general use in American type foundries.

This same volume gives an illustration of a type-casting machine, and describes it as follows:

"A type-casting machine consists first of a small melting-pot, which contains the molten metal. In the interior of the pot is arranged a FORCING PUMP and a valve for admitting the metal under the piston, and also for preventing of the return of the metal into the mass in the pot when the piston is depressed, and thus securing the full force exerted upon the piston being transmitted by the piston to the molten metal under it, and *forcing* it *through* a *narrow channel* to the *mould*," etc.

The Century Dictionary, Vol. 3, p. 2531, in describing pressed glass, says: "Glass, while in a molten state, is brought to shape in a mould by a plunger."

The Encyclopedia Brittannica, 9th edition, Vol. 18, p. 481, describes a method of casting steel ingots employed by Sir Joseph Whitworth, by applying hydraulic pressure to the metal in the mould until it solidifies.

which "has been adopted by the inventor with great success in the prevention of blow-holes and similar imperfections."

Now, let us see what all this has to do with dentistry. (See Fig. 7.) This illustration shows a machine devised by Dr. C. C. Carroll, of Meadville, Pa., in 1885 or '86, for casting plates by the pressure process. Dr. Carroll turned over his invention unreservedly to the profession, the following paragraph appearing in the copy of Directions given with the machine:

"These goods are placed before the profession on their merits, upon the most liberal terms, without any charge of license or royalty upon the patents by which they are covered, and by the use of which all other patents for crowns, bridges, etc., are evaded."

He also gives full directions for casting, and says: "Maintain the pressure about five seconds to give the molecules of metal time to arrange themselves *under pressure*. Otherwise there may be small pits over the surface of the denture."

He further says: "Mould upon the teeth in thin paraffine wax the crown or bridge that is intended to be worn," etc. It seems fair to assume that he made his abutments and no doubt his inlays in the same manner.

Now, let us turn to periodical literature on the subject:

In the account of the meeting of the First District Dental Society, State of New York, Tuesday evening, March 13th, 1894, at the New York Academy of Medicine, published in the *Dental Cosmos*, Vol. 36, No. 5, May 1894, appears the following:

"Dr. George F. Reese, of Brooklyn, N. Y., demonstrated the method of adjusting his gold alloy cast crown:

"A right superior lateral root was selected in a lady patient. He had the root already prepared; then the artificial crown, which was a plain rubber tooth, was ground to fit to the root and gum; next a piece of platinum wire, coated with gold the length of the root, was hammered flat at the exposed end and bent into a foot shape. It was then fastened by wax to the artificial crown and an impression of the root was taken. This was put in and removed a number of times, the surplus taken off with a heated spatula until adaptation and contour were correctly obtained, down to the finest detail. It was then placed in cold water to harden the wax and tried in again. Everything being found satisfactory, two points of wax were put on the back of the crown, which was then invested in plaster of paris. After hardening the wax was grooved out, the matrix heated, and the wax melted out by a fine stream of boiling water. Two pockets were then made, one being the pouring the other the vent gate. This was again invested in plaster, which was now ready after hardening and standing a couple of hours to be put in the drying oven. When dry, which is shown by the mirror test, the gold alloy was melted and heated until it turned a purplish tint, when it was ready to cast.

"The doctor, after finishing, proceeded to insert a duplicate crown. By so doing it was shown that the crown fitted perfectly. He then permanently fastened it by drying out the root and coating the crown root with oxyphosphate cement."

Page 269 of the **April**, 1889, *Dental Cosmos*, shows us the following: "Dr. Reiss, of Brooklyn, showed a specimen of an improved porcelain crown."

Page 293, same number: "Dr. J. N. Crouse, by permission, called attention to the Dental Protective Association. He said that it was necessary to act at once, as they must have money now to carry on the fight against The Tooth Crown Company."

In concluding I wish merely to say that I believe in giving credit where credit is due; and that to me it seems that credit is, in this case, undoubtedly due to the man who devised the crown and bridge that has stood the test of time, and promises to stand indefinitely, rather than to one that has done nothing more than to revive an art that has been practiced in all branches of metal work from time immemorial, that probably is as old as man's knowledge of metals, and for which, at this late day, great claims for originality are made.

As to the kind of work that is being done in dentistry along that line, the average result is described by Dr. Rhein, of New York, who, at a recent dental meeting, spoke of the average inlay as "A floating island of gold in a sea of cement."

Unless the average practitioner shall learn speedily to cast better inlays and insert them with greater skill, there most certainly is grave danger that the inlay method will bring discredit upon the entire profession.

THE CEMENT LINE IN INLAYS.*

By Clarence J. Grieves, D.D.S., Baltimore, Md.

THE ONE leading question foremost in the mind of every operator who attempts restoration of destroyed dental tissues, second only to the removal of the destroying agents and the destroyed and the shaping of caval edges, is whether the final cavo-juncture between filling and enamel will be lasting mechanically to meet stress, and to prevent retention centers for recurrent caries and adhesive chemically to prevent leakage by solution, by sealing these edges; so obvious is the importance of the subject, for it is the final equation in the art of operative dentistry, that this paper needs no further introduction. No matter what the method or filling material heretofore employed, its perfect adaptation required cavo-surface contact excluding mouth juices; edge strength to meet occlusal food impact supporting caval enamel edges; smooth surfaces to prevent re-attachment of gelatinous carious plaques; extension out into the embrasures to prevent the retention of food and be cleansed by the brush of it in mastication; practiced with varying results dependent on the material, location of cavity, skill of the operator, immunity of the patient, etc., etc., we find all of these time-honored requirements for a successful contact operation completely reversed by the advent of the method of the cemented inlay filling.

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*Read before the Indiana State Dental Society, 1911.

NOTE—The writer respectfully refers all interested to his paper, "Cemented Inlays or Contact Fillings, Which?" read before the Virginia Dental Society, August, 1906, and published in the DENTAL SUMMARY, which deals with work on the first phase of this subject, and is necessary to an understanding of his position in this article.

During the inlay period of—say the past fifteen years—long enough in all reason to test a new principle—we note a paradox of both man and method; the same operator who formerly spent hours in attempting these perfect adaptations of gold foil to caval walls is now willing to leave them, to a degree, at least, marginally open to the wash of the saliva; proximally, in the same mouth environment, we daily see porcelain inlays with cemented joints washed out exposing enamel margins, through which the light rays pass into the porcelain, thus, in the only way matching the tooth surfaces which they restore, lying directly adjacent to gold foil operations in perfect contact with similar enamel caval margins. Both operations apparently saving tooth structure, yet based and built upon principles diametrically opposed, can both of these methods be right? Are the countless daily converts to the cemented inlay wrong in thus forsaking axioms sanctioned by long experience? The answer to these and many other associated questions is, we believe, to be found in a study of how mechanically-made contact on the one hand and chemically-made adhesive cemented contact on the other will meet and overcome the bite stress and carious environs of the human mouth. As soon as we depart from the teachings of the fore-fathers, absolute marginal contact of filling material and cavity edges, we find the greatest divergence in principle and method amongst the inlay "cult" in caring for these edges, for while all inlay operators insist on an adhesive cementing media between filling and tooth, they sharply divide on the final cavo-surface finish of the filling into:

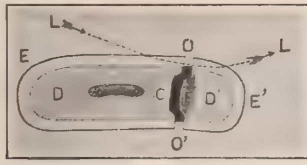

Fig. I

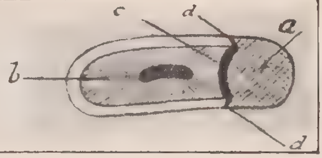

Fig. II

Fig. I. From Nyman's "Porcelain Problems." *Cosmos*, 1905, diagrammatic section showing how washout at "o" in butt joint porcelain filling affects color, "e" and "d" section of tooth; e' and d' filling. Note the necessary washout at o'-o of cement c that filling may match.

Fig. II. Application of the same diagram by writer to gold inlay lap-joint; "a" gold inlay, "b" section of tooth, "d" lap-joint from which there is little loss of cement "c."

"A," Fig. I. *Butt-joint operations*, necessary from the friability of the material *in all porcelain fillings, where the cementing media is ex-*

pected to wash out the depth of the width of the joint,[12] that the filling may reflect light and match; the cavo surface angle is at right angles, or 90 degrees, as is the filling surface angle; the joint is open to the pump of foods in bite stress when exposed, and to cement solution from mouth fluids. With the finest technique these joints in porcelain inlays can be made only as fine as the thickness of the matrix foil after burnishing. Head[1] says such joints are from 1½ to 2½ times the thickness of the foil used (.0001 of an inch); at the best, they are as open as the size of the cement powder granules; this is necessarily limited because extremely fine powder makes cement set so rapidly as to be impractical. Poundstone[2] found only five out of all the cements studied with powder granules, after solution in mixing fine enough to permit a joint .0001 of an inch under 25 pounds' pressure. The *butt-joint* in gold inlays is subject to all of the doubtful variations produced by contraction of wax and metal and expansion of investing material; if the inlay exactly fits the cavity it will protrude by the distance of the largest cement powder granules which have not gone down in the mix.

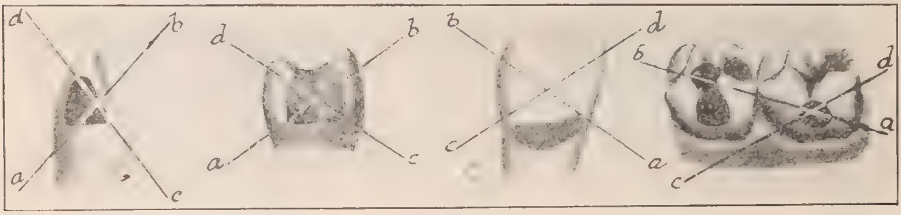

Fig. III

Fig. III. Cuts of filling from Black's "Operative Dentistry." Intersecting lines made by the writer.

"B," Fig. II., *Lap-joint operations*, possible always from the ductility of the material, gold and its alloys, *in all gold inlays, where the marginal cementing media is not expected to wash out* for appearances; the cavo-surface angle is anywhere from a little less than 90° to 40°, often topping enamel rods as in the best foil operations; the marginal cement is protected from the pump and lave of bite stress and to a degree from mouth fluids by burnishing down the lap to the enamel rods, thus taking up any protrusion made by cement granules in the cement line *which does not face* the impact of foods as in *butt-joints*, but rather *faces directly away from it*, a great advantage.

These two great classes must be subdivided again into:

FIRST. Those which on section show the cementing media throughout the filling as only a line on the pulpal and axial walls, the filling seated mechanically in the cavity.

SECOND. Those which on section show the cementing media as a line only at the margins appearing in bulk throughout the filling to ofttimes as much as one-third on the pulpal end axial walls; the filling may have some mechanical retention, but more is expected of the cement "en masse" as a retainer.

[12] Nyman, J. E. Porcelain Problems. *Dental Cosmos*, 1905.

[1] Head, J. Test of the Inlay Cement Problem. *Dental Cosmos*, 1905.

[2] Poundstone, G. C. Discussion of the Cement Problem in Inlay Work. Proceedings, Fourth International Congress.

All of these classifications are absolutely necessary, because of the vast difference in behavior of the cement line as between butt and lap-joints in all mouths; further, it was found early in these observations, which were undertaken some years ago and have been followed up both in and out of the mouth, particularly with honed sections, that while cavities and inlays made by any method were subject as all operations should be to the rules laid down by Black,[3] there were certain exceptions to these rules, particularly in butt-joints, in the areas of possible damage which are diagrammatically here shown, and may be known as the *vulnerable inlay areas*, defined as follows:

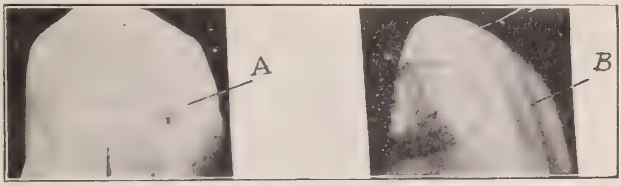

Fig. IV

Fig. IV. "A" butt-joint in porcelain inlay, and "B" lap-joint in gold inlay before exposure to mouth fluids and bite stress; presented for comparison with those showing use in mouth.

Dividing the proximal surfaces, Fig. III., of the incisors and canines by a right line, "a-b," which arises just at the gingivus in the labio-gingival angle and cuts the surface emerging on the lingual surface midway between incisal and gingival, by a second right line, "c-d," which arises at the gingivus in the linguo-gingival angle, cuts the surface emerging on the labial surface one-third of the distance from the incisal to gingival; the proximal surface is thus divided into unequal triangles which may be termed the labial, lingual, incisal and gingival triangles, the smallest of which is the lingual. Similarly, the proximal surface of bicuspids and molars, Fig. III., may be divided by the line "a-b" which arises at the

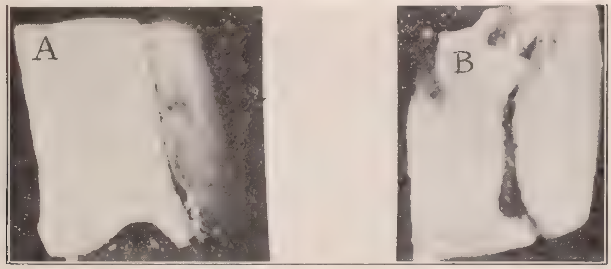

Fig. V

Fig. V. "A" lingual and "B" labial view of a porcelain inlay in bad mouth environs six years. Note the heavy bite stress shown in the enamel of the incisal edges. When set these butt-joints were above the average. Note the damage in the vulnerable mechanical areas and all down the lingual; the solution at the gingivo-labial angle and yet the washouts were not deep nor was recurrent caries noted.

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[3] Black, G. V.—Operative Dentistry.

gingivus in the bucco-gingival angle and cuts this surface emerging a little gingival to the linguo-occlusal angle, and by a second line "c-d," which arises at the gingivus in the linguo-gingival angle, crossing the surface to emerge slightly gingival to the bucco-occlusal angle, thus dividing the proximal surface into equilateral triangles, respectively, the buccal, lingual, occlusal and gingival.

The labial surfaces of incisors and canines and the buccal surfaces of bicuspids and molars may also be so divided by the lines "a-b" arising for the molars and bicuspids, Fig. III., at the gingivus on the mesio-gingivo-buccal angle crossing the buccal surface and emerging at the disto-bucco-occlusal angle, crossed by the line "c-d" which arises at the gingivus in the disto-gingivo-buccal angle and emerges at the mesio-bucco-occlusal angle, dividing the surface into triangles, the gingival, occlusal, mesial and distal.

For the incisors and canines, Fig. III., the line "a-b" arises at the gingivus in the mesio-gingivo-labial angle, crossing the labial surface to emerge at the disto incisal angle crossed by the line "c-d," which arises at the gingivus on the disto-gingivo-labial angle and crosses the labial surface to emerge at the mesio-incisal angle dividing the labial surface into triangles, the incisal, gingival, mesial and distal.

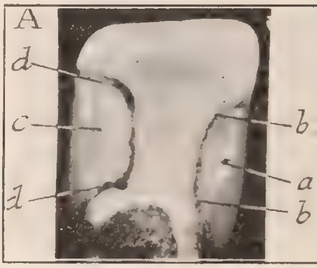

Fig. VI

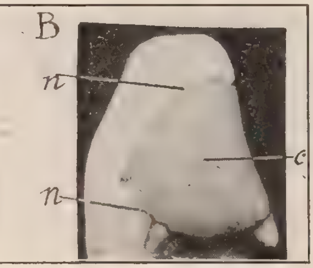

Fig. VII

Fig. VI. The lingual view of a lateral incisor containing mesial and distal porcelain inlays placed at the same time. The mesial "a" lapped the adjacent central and was sheltered from the bite pump. Note the fairly good joint at "b" after three years. The distal inlay "c" was thus obviously more exposed to the bite with resultant joint damage at "d."

Fig. VII. Proximal view same tooth, porcelain inlay "c." Note the very good cement joint on the labial at "n." The gingival caries seen in both these pictures is due to rapid recession, is recent, and has nothing to do with the crown conditions, which were maintained for three years.

It is obvious that damage to the cement line can come from two sources, viz., mechanically from foods under bite stress, pumping or laving out the cement and joint contents, and chemically from a solution of cement due to acidity of saliva and mucus, whether local or general. The incisal and occlusal triangles include the areas of damage by bite stress, and may be termed *the vulnerable mechanical areas;* where the lines arise in the labio-bucco and linguo-gingival angles and the incisal half of the gingival triangle are the most dangerous to the cement line from local acidity and may be termed *the vulnerable chemical areas.*

Certain areas in normal mouths appear more immune than others to cement solution as the labial, buccal and small lingual triangles and particularly the lower half of the gingival triangle, which is sheltered by a healthy gingivus, of which more will be said later, for, indeed, it is the only shelter for this line where there is general mouth acidity.

The application of these lines should not be made too literally, and they cannot be drawn ‘‘hard and fast,’’ as they are subject to change in inter-proximal contact, gingival recession and the curvature of the embrasures for the proximal, and lip and cheek contact for the labial and buccal, but they give a most valuable general idea to the operator in cavity preparation.

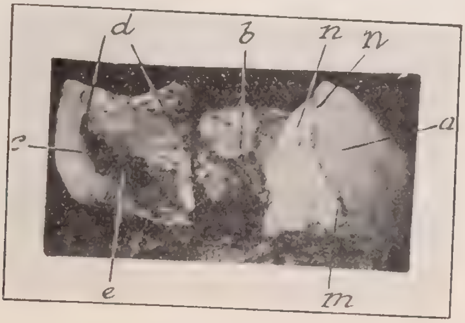

Fig. VIII

Fig. VIII. Showing a large mesio-occlusal porcelain contour; superior first bicuspid at ‘‘a,’’ which fortunately split in attempting an occlusal section through it, and a disto-occlusal amalgam filling at ‘‘b’’; ‘‘c’’ represents the cut occlusal portion of the buccal enamel, ‘‘d’’ the cavo surface enamel parted from ‘‘a’’ and containing some cement; ‘‘e’’ the darkly stained wall from ‘‘b’’ amalgam filling. Note the washout on cement line being greater on the bucco-occlusal at ‘‘n’’ than the solution at the bucco-gingival angle at ‘‘m’’ from acidity.

For instance, if we take the classification of butt and lap-joints and apply the rules of these areas we find from the study of a large number of specimens both in and out of the mouth, that in:

Butt-joints, Fig. IV. A, usually porcelain inlays, after a period in the mouth dependent on mouth conditions to be mentioned later for *Proximal Cavities in Incisors and Canines,* just as the operation invades *the vulnerable mechanical area* or incisal triangle, Figs. VI. and VII., so is the cement pumped out sometimes to the entire depth of this triangle, or one-third the axial walls, Fig. V. A; no matter how slightly the joint is exposed in the area to the lingual there is always loss of cement frequently clear through to the labial wall, with consequent loss of cavo surface enamel and filling edges, Fig. V. B; there is one exception in these areas where large restorations, as the whole incisal third in canines and incisors or occlusal third in bicuspids are made in porcelain, here butt-joints do well on the buccal and lingual in bicuspids and the labial in incisors and canines where parallel to the incisal and occlusal surfaces the cement line is sheltered from the bite pump by a wall of porcelain opposed above it;

the lingually-exposed joint is quickly pumped out and soon stands as does the enamel, alone.

Proximal cavities in *Bicuspids and molars*—Here, with even greater force, the rule for mechanical areas applies to the occlusal triangle, Fig. VIII.; frequently gold inlays with butt-joints are seen in this location, but whether gold or porcelain we find the cement pumped out down along the axial wall often over the pulpal wall and always washed entirely from the bucco and linguo-occlusal angles.

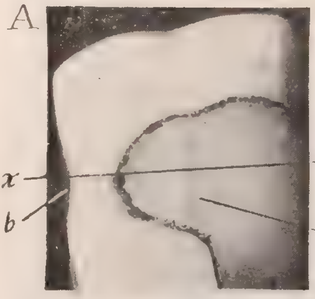

Fig. IX

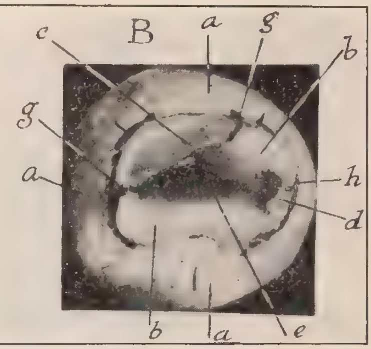

Fig. X

Fig. IX. Lateral incisor, large porcelain inlay at "a," time in the mouth about five years; cohesive gold filling at "b" placed some years before porcelain; stained with eosin, cut to section line x-y and honed; mouth of the erosion type.

Fig. X. Section cut at x-y retained in cement "a." Porcelain inlay section at "c," enamel and dentine at "b," gold filling section at "d"; dark area, stained cement at "e." Note the depth of washout at "g" and leakage and recurrent caries at "h."

Labial cavities for *incisors and canines* in the incisal triangle—The cement line does well except in erosion mouths (to be classified later), where the cavo surface margins disappear "as though brushed away," leaving the filling "high and dry." Fig. IX.

Bicuspids and molars—In the occlusal triangle the line suffers from bite stress just in proportion as the inlay invades that triangle, and as the tooth, particularly the inferior, tilts to the occlusion, Fig. III.

Caries can and does recur after this laving process, Fig. X., when shelter is afforded for attachment of plaques, deep under the caval walls; the rule being that when the cement has laved below the depth of the enamel rods in mouths prone to caries, it begins at any shelter on the axial dentine.

Butt-joints—In the vulnerable chemical areas named, the labio-bucco and linguo-gingival angles and the upper half of the gingival triangle, or, in other words, in the usual retention centers dangerous to all contact operations, the cement line suffers, Fig. XI., from recurrent caries every time a chemical solution of cement occurs to the depth of the enamel, Fig. XII., but the percentage of its occurrence to any great depth is much smaller than the "wash-outs" in the vulnerable mechanical areas, just as the percentage of recurring decay is very much less for inlays than for contact operations in these dangerous areas, Fig. XIII.; this we may account for later dependent upon a number of modifying factors, local and general.

This is just where the variation for inlays previously mentioned comes in, from the rules of Black, for contact operations: due to this fact it is here laid down as a rule that in butt-joints, or, in other words, porcelain inlays, for no judicious operator would use a butt if he could make a lap-joint, the cement line should not be extended any further out into the embrasures proximally, and particularly not extended into the incisal and occlusal triangles, than is absolutely necessary for removal of damaged tooth structures; in other words, the butt-joint operation should be "extended to prevent" as little as possible, Fig. VIII., as there is more danger from the mechanical areas named in "pump out" of cement, Fig. V., than in the chemical areas named from solution of cement, Figs. VI. and VII., all of which is directly opposed to the correct rules for contact operations.

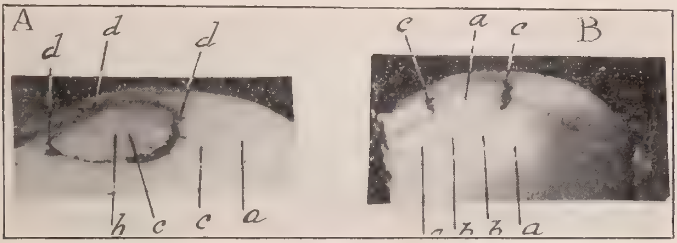

Fig. XI Fig. XII

Fig. XI. Small disto-proximal filling left superior canine stained with eosin; in use twelve years; "a" enamel, "b" porcelain filling. Note that the same drying crack "c," which split the enamel after excision, continues on through the filling, and the filling is well retained, notwithstanding the ugly washouts at "d."

Fig. XII. A section cut out of same tooth and filling on through the labial at "a" to show the state of the caval cement, which is good at "b," and the dangerous looking washout shown at "d," Fig. XI, are of little depth, the eosin stain having gone only as far as "c."

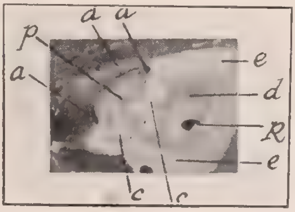

Fig. XIII

Fig. XIII. Section without staining cut through proximal porcelain filling, lateral incisor; time in mouth, 13 years; "e" enamel, "d" dentine, "r" pulp cavity, "p" porcelain filling. Note the perfect condition of the cement at "c," notwithstanding the open washouts at "a" in the butt-joint, which has undoubtedly been protected by the contained film.

(To be Continued.)

THE TREATMENT OF THE TEETH AND GUMS FOR THE CURE OF PYORRHEA ALVEOLARIS.*

By Joseph Head, M. D., D. D. S., Philadelphia, Pa.

UNTIL recently instrumentation that removed the tartar scale from the roots beneath the gums was the chief reliance for the cure of pyorrhea alveolaris. It is true that various medicaments such as 75% lactic acid and 50% sulphuric acid were used with the idea of softening the scale and rendering it more easily removable, but the great objection to these medicines lay in the fact that when diluted by the fluids of the mouth, they would attack the enamel of the teeth more rapidly than the tartar. A number of dentists have been able to tighten single rooted teeth partly by scaling and partly by splintering to adjacent firm teeth, but in cleaning the calcareous deposits from the bifurcation of roots only a few dentists have really succeeded, and some of these, by the ruthlessness of their instrumentation, have at times caused unjustifiable injury to the cementum and pulpal vessels. It has also been noted that deep pockets occasionally appear around a tooth that is sensitive and loose during mastication, and yet the most careful manipulation of the scaler has failed to show the presence of tartar scale. This seemed to prove that the tartar scale might not be the prime cause of pyorrhea alveolaris, and it also seemed to prove that the mere absence of tartar would not of itself be sufficient to effect a reattachment of the gums to the tooth.

An agent that would remove the last microscopic scale from the tooth and would also remove any crystalline deposit from within the adjacent tissue was evidently needed. It was appreciated by the thoughtful dentist that gout deposits might be laid down in any tissue of the body whatsoever, and that if such a product should be deposited in the arterioles of the gum circulation no instrumentation or remedy could be effective until the arterioles of the gum tissue were effectually freed from such an infiltration. In plain words, where the deposit was confined solely to the root of the tooth, instrumentation might possibly succeed in causing reattachment of the gum and root, but where the deposit was in the gum reattachment could only be obtained by a stimulating solvent that would free the gum and peridental membrane of its crystalline deposit, and in so freeing them stimulate them to form a mutual reattachment.

Some five years ago it was my good fortune to discover that commercial hydrofluoric acid would disintegrate tartar with no macroscopic action on either cementum or enamel of the tooth. The poisonous action of this acid precluded its use as a therapeutic agent to be applied to the gums. Later, however, through an extensive series of experimentation it was proven that a twenty to twenty-three per cent solution of bifluoride of ammonium (an acid salt of hydrofluoric acid) will disintegrate the tartar on a tooth as readily as hydrofluoric acid itself and also leave the tooth apparently unsoftened. This solution can also be applied to the gums with the most beneficial effect, as it seemingly stimulates the tissues and diseased bone to such healthy action that deep pockets around loose teeth speedily fill up with healthy, firm tissue and the sensitive teeth reunited to the gum, become secure and useful agents in the process of mastication. The solution of bifluoride of ammonium can be injected once a week into the pockets around loose teeth. After one or two injections the soreness will largely disappear and all the tartar scale that could not be easily and painlessly removed at the first two sittings tend to be so loosened that its thorough removal by the scalers is easy for both patient and dentist. After four or five applications, one week apart, black scales that have escaped the scaler will sometimes be found floating loose in the pocket, so that they can readily be picked out and the root will be as smooth as velvet to the touch of an instrument. When this stage has been reached it will be found that the scalers cannot be carried as deeply into the pyorrhea pockets as was easily possible in the beginning. To do so causes pain and a free flow of clean arterial blood. This indicates that new granulations are forming and they should not be ruthlessly broken up, although a careful exploration for tartar on the root within the pocket is always advisable, but reattachment of the gum to the root can be accepted as assurance that that portion of the root has been thoroughly cleaned and so the scalers need not be driven into the reforming tissue with the idea of being extra thorough. When this stage has been reached we can cease the use of the scalers and merely make weekly applications of the bifluoride solution. If, however, at the end of two or three months the pockets have not entirely healed, they should be re-explored with the scalers and the treatment repeated as for a new case, although most of the pockets by this time will have disappeared and the gums, with a slight contraction at the neck, will be found firmly adherent to the tooth.

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*Read before the Ohio State Dental Society.

Teeth that have lost more than half their gum attachment under this treatment have become firm and comfortable to the action of normal mastication. In fact, such tightening has been obtained after there has been so much loss of tissue that the question has arisen whether the immobility is not occasioned by a process somewhat similar to bony ankylosis that occurs during implantation. However, it seems to be a normal and permanent tightening and has now in some cases lasted during a period of four years. With loosened teeth where the pockets are unaccompanied by the presence of calcareous deposit, the weekly applications of the bifluoride solution causes the gums to rapidly reattach themselves to the teeth without the use of the scalers at all and the soreness and gum inflammation rapidly disappear. So long as these results were obtained only by me, it was natural to entertain the thought that I might be over-optimistic and that the therapeutic action of the bifluoride solution was too remarkable to be true, but since hundreds of dentists have used it for the last two years with a great measure of success, and the more they follow directions the greater the success, I can now feel that my missionary work in this line is largely at an end, for the verdict of future time can safely be trusted to give the bifluoride its true position in the therapeutic dental world.

Having stated the actual clinical facts relating to the bifluoride of ammonium, a few theoretical speculations on its possible physiological action may not be uninteresting. In the first place the fluoride salts have been known to be strongly antiseptic during a period of some thirty or forty years.* They have been used in the manufacture of beer. In the seventies Thompson found that a 0.61% solution of Sodium Silico fluoride is non-irritating to wounds and antiseptically stronger than a 1-1000 bichloride of mercury solution. This may prove valuable as a mouth wash and is a field I am at present investigating. Be that as it may, the fluorides have long been known as valuable antiseptics. But the bifluorides, where the hydrofluoric acid has been only half neutralized, have been discovered at a comparatively recent date, and the fact that free hydrofluoric acid is so widely known as a frightful poison has no doubt shut off therapeutic investigation in this direction. The interesting discovery that hydrofluoric acid would disintegrate tartar without hurting the teeth impelled me to investigate the therapeutic value of this acid, and Fortune favored dentistry in giving us the bifluorides that seem to have the therapeutic value of the pure acid without any of its terrifying dangers. In considering the physiological reaction of the bifluoride of ammonia, it is not unreasonable to suppose that it not only softens the tartar about the tooth but that it also dissolves out any microscopic calcareous infiltration that may be present either in the peridental membrane of the root or the adjacent tissue. Its great penetrating power would be especially valuable in dissolving the calcareous deposits within the arterioles thus, as it were, revivifying and rejuvenating the gums that thereby take on a new lease of life and development. This explanation may or may not be true, but it is at least a partial reason for the almost miraculous reformation of rigid tissue that at times occurs between teeth where the bony septum and gum have entirely disappeared, leaving a large hole. If the bifluoride solution can so stimulate connective tissue cells, there is no reason why it could not also stimulate the osteoblasts and cause a redevelopment of bone; and the fact that the fluorides are strongly antiseptic is but another reason why the revivified tissue should be able, even more rapidly, to set about its work of repair. Nevertheless, interesting as these speculations are, they are at the present only speculations, and until they are proved or disproved by scientific investigation we must content ourselves with the fact that the judicious use of a 23% solution of bifluoride of ammonia can hasten the tightening of teeth and repair the lost tissue.

Let us now consider some of the other essentials in the cure of pyorrhea that are of equal importance with the judicious use of the scaler and the bifluoride of ammonium solution. Any malocclusion should be remedied so that the loose teeth shall be relieved of the excessive pressure of mastication occasioned by the thickening of the inflamed peridental membrane. When the pocket has approached an apical foramen near enough to infect the pulp, the pulp should be destroyed and the root canals thoroughly treated and filled. This should be especially looked to in the case of molars where the pocket extends through the bifurcations and down to the tip of one of the roots. It is sometimes excellent practice to cut the crown midway through the grinding surface, through the juncture of the roots, extracting the diseased root with its side of the crown. This leaves the other root or roots so that they can be filled and cleaned as easily as a bicuspid. With upper first molars this operation is most satisfactory, as it leaves the mouth, to all outside appearance, unchanged. This operation also makes it so that the remaining root or roots do not have to stand more than their fair share of mastication and so works for a more rapid recovery and stability.

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*See Rideal's Disinfection and the Preservation of Food. Page 79, 3d Edition, 1903.

The patients should always be properly instructed how to keep the mouth clean. This is a most important essential which is frequently neglected. We tell the patients to brush the teeth morning and evening with the tooth brush, and yet we too often allow the back teeth to be covered with bacterial deposits day in and day out that could easily be removed by the proper use of the brush. Dr. Black tells of a case of erosion where, to prove that the brush never went back on the molars, he made a mark on a bacterial plaque in the back of the mouth and when the patient returned in a day or two he found the same old plaque and the same old mark undisturbed. He did that for a scientific purpose. But how many of us find the same state of affairs in the daily routine of our practices? The upper and lower wisdom teeth decay simply because they are not cleaned. Structurally they are not weaker than any of the other teeth. At each visit of a patient we should make an examination of the buccal necks of the upper and lower twelfth-year molars and wisdom teeth and see if the bacterial plaques have been accumulating since the last visit. If they are present, and they frequently are, the patient should be given a tooth brush and should be told how to remove the plaques by brushing. Nine-tenths of them will not succeed, and then it is distinctly our province to show them how to remove the plaques by brushing and see to it that they do know how. For tooth brushing is a great art and this art has been retarded by much contradictory teaching. We talk about keeping the teeth clean with a tooth brush and we do not sufficiently take the pains to see if the plan of our instruction is effective or to see if our instruction is carried out. The final test of a method of brushing the teeth is, does it leave the teeth clean? As a matter of fact, few patients keep the teeth clean except with careful coaching on the part of the dentist, who each time the patient comes to him should not only point out where the bacterial plaques remain undisturbed, but should demonstrate how the brush should be used to remove these plaques. I believe that the gums as well as the teeth should be thoroughly brushed twice a day of all bacterial plaques, and I have proved on my patients that healthy gums are no more injured by a good brushing than is the skin adjacent to the finger nails. Inflamed soft gums will unquestionably be made sore for the first week or so, but with persistence on the part of the patient and assistance on the part of the dentist in touching up the sores with nitrate of silver, the gums will soon become inured to almost any friction the tooth brush can give them. But instead of insisting that the patients shall completely cleanse all of the teeth and gums with the brush, many of us are satisfied to let patient brush only the teeth anterior to the sixth-year molars, and in lieu of an antiseptic we recommend the use of tooth powders that erroneously claim to have an antiseptic oxygenating action, when any amount of such powders capable of being placed on a tooth brush does not liberate enough oxygen to make over three or four drops of a 1 per cent solution of peroxide of hydrogen. And yet for the so-called antiseptic action of three or four drops of 1 per cent peroxide of hydrogen on the large masses of bacteria usually found in the mouth, which action is no more valuable than distilled water, our patients are allowed to scrub the front teeth prettily clean while they cut away both the enamel and cementum. For bristles charged with chalk, not to speak of cuttle fish bone and pumice, will wear away both cementum and enamel, but bristles wet with water or a mild antiseptic can clean teeth of bacterial deposits without erosion. All discolorations that cannot be removed except with grit should be removed by the dentist, not the patient.

Then first and foremost in the treatment of pyorrhea we should teach the patient to brush the teeth clean. We should explain that there can be no permanent cure unless the teeth are kept clean. Secondly, he should be told that as the tooth brush cannot get in between the teeth, "morning and evening the bacterial plaques should be swept away by the careful use of floss silk." Thirdly, he should be told that a mild antiseptic should be held in the mouth for not less than two-minutes morning and evening. Any available antiseptic that can be held in the mouth cannot kill the masses of bacteria such as are found in bacterial plaques. A mouth wash can kill only the outside layer of such a mass, leaving the germs next to the tooth and gum free to go on with their work of destruction. But a good antiseptic wash, if it is held in the mouth sufficiently long, can kill or inhibit the action of the thin bacterial film left after the proper use of the floss silk. Having carefully instructed the patient in the home prophylaxis that all patients should observe each day, after the pockets have been healed and the teeth have become firm, it ought not to be difficult with your continued supervision to keep him permanently comfortable.

In closing, perhaps it would be well to tersely run over the steps of my treatment of pyorrhea. Take off all tartar that can easily be removed and cleanse the mouth as thoroughly as can be painlessly accomplished, at the same time instructing the patient in the use of brush, floss silk and mouth wash, pointing out particularly where he fails to reach the bacterial plaques, and demonstrating what motions of the brush are necessary to remove the plaques. The syringe should then be filled with bifluoride of ammonium and the platinum point inserted near to the bottom of the pocket or pockets, which should be filled full from the bottom to the top. During the operation of injecting the pockets the cheek and tongue may be guarded with napkins with which all excess or overflow should be wiped away. Then the patient should be allowed to spit for a minute or two, when the mouth may be slightly rinsed with water to remove any excess acid. Less irritation to the mucous membrane occurs from this method than that formerly advocated, which consisted in allowing the solution to rest in the pocket for a minute or two minutes. The patient is then dismissed with the instruction to return in a week. He is also cautioned to carefully observe all directions on home prophylaxis. When he returns next week the teeth are again sealed as far as feasible, cleaning them thoroughly with brush and pumice and a coating of tincture of iodine. When this is finished another application of bifluoride is made as before. The procedure for the third sitting is as for the second, but usually after that the teeth are free from tartar, the pockets have started to heal and the treatments need be for a period of only about fifteen minutes, just long enough for the application of the bifluoride and the little cleaning and scaling required. The bifluoride should not be applied oftener than twice a week and usually once a week is more desirable. Of course, loose teeth should be tied to their secure neighbors wherever feasible.

We should also be ever watchful for a systemic disease of which the pyorrhea is a mere symptom. Pyorrhea is frequently associated with gout, diabetes, Bright's disease and other bodily disorders that directly affect the cell metabolism of the various tissues. These diseases may or may not be present, but wherever a pronounced case of pyorrhea presents itself for the first time it is wise, conservative treatment to request a urine examination and the friendly cooperation of the family physician.

DISCUSSION.

Dr. J. R. Callahan, Cincinnati: I feel that it is a great honor to be selected to open the discussion on a paper coming from a man who occupies or holds so high a position in our profession as does Dr. Head.

The essayist says: "Some five years ago it was my good fortune to discover that commercial hydrofluoric acid would disintegrate tartar." I wish to enter a mild protest as to the form of this statement. I protest because of the construction or interpretation that many hearers and readers will put upon the statement as written.

It certainly is a discovery of great importance to the practicing dentist, but I fear that many will feel that the statement means that it was a lucky discovery. What I want to say is that there was not nor is an element of luck in the discovery. Were the discoveries of Columbus, Morse, Edison or Harvey lucky? Luck means that which happens to a person—chance, accident.

Good fortune, or fortune in this sense, my dictionary says, means chance or luck. Fortunate means coming by good luck; some unexpected good reward.

As each one of you open up your historical memory cells, it will require no argument to show you that Columbus did not discover this continent by accident. Morse did not send messages over a wire by chance. Edison did not become an electrical wizard through good luck. Was the discovery of the circulation of the blood by Dr. William Harvey by chance or good fortune? It was the lifelong habit of these men to search and work to find and understand the fundamental principles underlying every phase of their life work. So it is with our friend Dr. Head. It was the result of habit that he placed a diseased tooth over night in a poisonous acid. It was the result of habitual observation that he afterward studied the condition of that tooth. Finding the tooth substance intact and the altered condition of the tartar scale and realizing the poisonous effect of hydrofluoric acid upon human tissue, his thoughtful and studious habits prompted him to devote his time and energy to further investigation, with the result that we have at our service the tartar solvent, an agent that will accomplish what he claims for it.

I am anxious that we do not discredit our achievements nor our profession by intimating that these great advances come by chance or luck.

We, the dentists of Ohio, recognize the dignity and value of your services.

It does not follow from what has been said, that the presence of a bottle of tartar solvent in the operating room will cure every case of pyorrhea that presents itself, nor will the promiscuous injection in or about the tooth sockets prove beneficial; in fact, may be injurious.

The essayist has pointed out the need of an agent that will safely remove the last microscopic portion of the tartar scale from the root surface. This can be demonstrated by mounting a tooth, on which a quantity of serumal scale has been deposited, in soft rubber or by holding the tooth in the fingers; then with scalers remove the deposits about as you would if the tooth was in its natural position, then bathe the tooth in alcohol and dry the parts with hot air. Examine the roots with a glass and, as a rule, a thin film of calculus will be found apparently incorporated in the cementum, especially on the more protected parts of the roots. The solvent will most certainly remove these films as well as those fine particles that are known to be lodged in the surrounding fibrous tissues. The hard substances that may be found in the adjacent soft tissues are not always tartar or of uric acid origin. Dr. Black points out the presence of hard formations within the peridental membrane, possibly the product of osteoblasts along the alveolar wall. These deposits must be removed before recovery is to be expected. To my mind the assistance of a solvent is sane treatment, even in those cases where vigorous curettement is indicated. I have found in my practice all that Dr. Head claims for the solvent.

I am particularly glad that the essayist has given, in detail, his method. So plain has he made the various steps that further amplification by me would only cloud what he has made so clear.

I would ask Dr. Head two questions: Is the solvent liable to increase in strength through evaporation? If so, how shall we reduce the solution to normal strength? I find that the presence of the solvent about the tooth roots causes considerable pain. Can the pain be alleviated without interfering with the beneficial action of the solvent?

There is a sentence near the close of Dr. Head's paper that deserves much more investigation and discussion than I am prepared to give it, viz., "We should be ever watchful for a systemic disease of which the pyorrhea is a mere symptom. The conservative dentist is not quite sure whether he is treating a cause or an effect."

The essayist gives very explicit and sensible directions for home prophylaxis. He has omitted gum massage. I believe massage to be of material assistance in bringing the oral or any other tissue to a state of health.

The peridental membrane is a connective tissue belonging to a large group of fibrous membranes that act very largely as a department of supplies to the tissues which they invest. They bear the blood vessels and nerves, and in some cases they receive partially, as in the periosteum for the bones, and in others wholly, as in peridental membrane for the cementum, the pabulum from the blood to be transmitted through their meshes to the point of assimilation. This fibrous membrane holds within its meshes all the cellular elements necessary to the development and functioning of the parts, as well as serving to attach the roots of the teeth to their alveoli. The blood supply to this membrane is very bountiful, partly through arteries that enter the alveolus at the apical space and breaking up into smaller ones, one or two branches going to the pulp, four to six or more branches passing down side of the root to supply the peridental membrane.

Notwithstanding this seemingly liberal blood supply, Dr. Black further says, "We may justly say that the blood supply of this membrane is received largely through the walls of the alveolus. So long as life lasts food must be brought to the tissues and waste products carried away from them. Blood is at once the scavenger and the food provider of the cell. The blood feeds the lymph and the lymph feeds the cell. The mean velocity of the blood current is greatest in the large arteries, less in the veins and least in the arterioles, capillaries and venules."

In gingivitis, either marginal or interstitial, or in pyorrhea, after the removal of the deposits, we have the tissues left in a state of irritation, inflammation or suppuration. In either case there is an interference, more or less profound, with the normal blood flow, consequently both nutrition and elimination are interfered with. Any treatment that will produce or assist in restoring a full normal flow of blood through and about the diseased area will hasten a cure.

Exercise that causes the muscle to contract, shortens and thickens the muscle cells, scattering some of its substance into the lymph space encircling it and absorbing food from its surrounding plasma.

Sir Lauder Brunton claims that the blood vessels are substantially enlarged in the active muscle after contraction and during the contraction itself. The interchange of products between blood and tissue is also accelerated. Not only is this true, but the actual nourishing power of the blood is augmented by this heightened activity.

Dr. Fletcher has called attention to the fact that one of the reasons for the hard and healthy gum tissues in some animals is the hard rubbing they undergo in the act of masticating food. So I recommend massage as the best exercise available applied to the gum, believing it will mechanically excite the blood vessels that supply the peridental membrane to empty their lymph spaces and hasten circulation.

Much more should be said of this paper and subject, but there are others to follow me.

Dr. Gillette Hayden, Columbus: We appreciate Dr. Head's appearance before our Society and are indebted to him for the time and energy he has devoted in writing and delivering this paper before us. It is to the sacrifices of these men with ideas that we owe our professional advancement.

This paper, dealing as it does with a material designed to remove calcareous deposits from the roots of teeth, is of exceeding interest to dentists in general, but more particularly so perhaps to those who are devoting most or all of their time to the removal of foreign deposits from the teeth.

Any material which will act as an acid in the removal of calcareous deposits ("tartar scale") from the roots of teeth, without injury to the teeth or surrounding tissues is most earnestly to be desired. Dr. Head is here to give us his individual experiences with bifluoride of ammonia as a solvent for tartar, and to enlighten us upon its action in the mouth.

In the opening paragraph the paper states that "Until recently instrumentation that removed the tartar scales from the roots beneath the gums was the chief reliance for the cure of pyorrhea alveolaris." After reading the paper the question naturally arises as to whether or not instrumentation ceases to be the "*chief reliance*" in cases where bifluoride of ammonia is used. The question seems pertinent considering the fact that so many practitioners are looking for a medicament which will, with little or no effort on their part, remove all deposits from the roots of affected teeth. So we ask the question, Is instrumentation relegated to a place of lesser importance even though the bifluoride of ammonia is used?

The thought brought out in the paper regarding the removal by dissolving of microscopic crystalline deposits from within the tissue adjacent to the tooth and from the arteriods, opens a field for much discussion.

We know, of course, that no free crystalline or calcareous deposit can form in the arterial system without death resulting from a clogging of the arterioles of the brain. But we can and do have an infiltration through arteriole walls of toxins produced in surrounding tissues. This infiltration at a given point results in leucocytosis, or the walling off of the affected area by the leucocytes. If the toxic invasion is too great for leucocytes to check it by walling off a part of the vessel wall, then the arteriole becomes filled with leucocytes and the blood is shut off from the tissues beyond. Pus is the result. The live tissue is constantly building up barriers to shut itself off from the encroachment of the poisonous products contained in the pocket around the root. The moment these destructive deposits, with their irritating and toxic accumulations, are removed from the root of the tooth reparative processes instead of combative processes are set up in the soft tissues, and Nature takes remarkably swift measures to clear away all foreign elements within the soft tissue, and rebuild. She seems only to need a fair chance in order to bring the parts back to health. So the thought comes, is the supposed ''deposit'' within the soft tissue removed by a solvent, or is that portion containing the supposed ''deposit'' already walled off by the action of the leucocytes, and exfoliating, forming pus? More information along this line is greatly desired.

Going back to the action of bifluoride of ammonia upon the calcareous deposits on the roots of teeth:

It seems that in Dr. Head's experience, four or five of the one- to two-minute injections of the bifluoride of ammonia one week apart, *combined with careful instrumentation*, suffice to free the root surfaces of all deposits in the large percentage of cases. That means that altogether the bifluoride comes in contact with the deposits from 4 or 8 to 5 or 10 minutes. Outside of the mouth, this amount of time is *far* from sufficient to remove deposits, so we must inquire as to whether, in the mouth, the adjacent soft tissues *absorb* and *retain* enough of the bifluoride of ammonia to permit of a long continued solvent action upon the deposits.

The bifluoride, if it is retained by these soft tissues, is necessarily much diluted, and again we ask, does a weaker solution act more rapidly upon the lime deposits than the 23% solution?

Because of the statement from patients that they preferred the pain of instrumentation to the pain of the bifluoride of ammonia injections, and because of the lack of a definite knowledge of the *now* proper technique in the handling of this material, I have not made a generous use of it. In those cases where it was used I failed to observe any added benefit, much to my disappointment. So from an extended personal experience I cannot draw, but these little experiments outside of the mouth have been interesting to me.

There is no doubt about the solvent action of this agent upon deposits provided time enough is given. But the time required for the complete removal of deposits outside of the mouth is at variance with that required by Dr. Head inside of the mouth. We realize that conditions inside and outside of the mouth differ greatly, but the increased solvent action of a quantity of the 23% bifluoride of ammonia in direct contact with the deposits on teeth outside of the mouth should make the action more prompt than a diluted solution in minute quantities in the mouth.

May we hear an explanation of this strange circumstance from Dr. Head?

Most heartily must we agree with Dr. Head in the importance he places upon instructions to patients in the care of the mouth. Truly the brushing of teeth is a ''great art'' practiced only by the few, and every dentist owes to his patients a careful instruction in the use of brush and floss.

No mention has been made of the treatment by the dentist to maintain a healthy condition in the mouth after it has been cured of pyorrhea, but I feel sure that Dr.

Head is as particular about the regular oral prophylaxis treatment for his patients as he is about the home prophylaxis.

Dr. Head (Closing): I wish to express my high appreciation of the compliments and the courtesies to which I have been treated. I fully appreciate that all I really have to tell you is that my experience with the solvent is beneficial and has continued beneficial. Any theory which I have brought forward is only a theory. Dr. Callahan's question concerning whether the solvent strengthens by evaporation, I think can be distinctly answered in the negative. I have kept a bottle of the solvent open, and I have noticed that as the liquid crystallized down to the last few drops it never seems to increase in strength. The commercial hydrofluoric acid is about 48 per cent and is neutralized with carbonate of ammonium to 23%, thus making the concentrated bifluoride salt solution. We have a concentrated solution of the salt, not the acid. I use this concentrated salt because I want to get as much of the salt injected into the tissue.

Concerning the question of pain about the roots during the application of the solvent, I ordinarily have not been troubled by that symptom, at least after the first application or two, because it has been my experience that biflouride has a tendency to cause the roots to become insensitive, but if, however, there is that tendency toward sensitiveness to a marked degree, I find that it can be overcome by the application of a strong solution of cocaine to the sensitive necks, and by the time the cocaine has worn off the irritating influence of the biflouride has also disappeared.

As to the massage, I can only echo as loudly as I can all that has been said about massage. It is most valuable. And I think, in every way, it should be encouraged. I feel, however, that the proper use of the brush on the gums is in itself a decided massage of the gums, and I can't help believing that a great deal of the success I have had with my patients is because I have insisted that they should vigorously brush the gums morning and evening. At first the gums become red and perhaps sore, but if the patients persevere in this daily routine the redness and soreness will cease and the vigorous scrubbing will give the mouth only a delightful sense of cleanliness.

Now, concerning Dr. Hayden's very interesting remarks concerning instrumentation, I do believe instrumentation is just as valuable as ever it was. I don't think it is quite so necessary to be so savage as we were, because the bifluoride makes the tartar scale come off more easily. Since this drug is able to cause the reattachment of the root to the gum that has fallen away where there is no scale, in that respect it is more valuable than instrumentation. Any dentist who will conscientiously treat these teeth without instrumentation and simply flood the pockets once a week will be most agreeably surprised at the reattachment that takes place between the gum and the roots.

Dr. Hayden has raised the question how the bifluoride will go in and dissolve the gouty deposits that are laid down in the tissue—how it does it I really don't know, as I have really made no investigation on that line. The point is, there is such a thing as arterial sclerosis. The bifluoride certainly does revive the gum tissue; it does cause it to suddenly act as though it had doubled the vital force that it had before. I don't know, I believe it goes into the tissue and stimulates those cells to renewed activity either by relieving them of the microscopic crystals or simply stimulating them—any way you choose. I believe it does it, but how it does it will have to be left to future discussion and investigation.

There is an extremely interesting point that Dr. Hayden brought out that I spoke of in my former papers but not in this. If we place a tooth in a solution of bifluoride of ammonium we must let it remain immersed for six hours before the scale is really very effectually dissolved, how is it then if we put that same bifluoride of ammonium in and around a tooth, that after four or five applications of a minute's duration each we find such an improvement? How is it that it takes so long out of the mouth and so little a time in the mouth? As I said before, I do not know the physiological effects on the body. Chance has fallen our way and luck is with us; it might have gone the other way; and heaven knows it has gone often enough against me at other times in my experimentations; this is but the evening up. The bifluoride does it, and we may be satisfied with that fact. Still there is this possible explanation: When we get burned by hydro-fluoric acid it seals itself in the tissues by hardening the outside surface, and that is why a burn with hydro-fluoric acid can never be perfectly neutralized. It is shut in, and no solution can reach it. It has left a dead wall of tissue behind. This bifluoride seems to have the property of going into the tissue and instead of leaving a dead wall stimulates the tissues, and if Dr. Hayden will try it in her mouth, if she has a pocket about a tooth, she will find that at the end of an hour or an hour and a half, if she will stick her tongue into that pocket, she will get a sour taste. While I think the process of making the application may take only a few minutes, I do feel that bifluoride is applied directly to that tissue for at least two hours, and that is the reason why I warn dentists not to use an alkaline wash in the mouth after the application, as it will partly neutralize any of the fluid that may still be around the tissues.

Now, concerning prophylaxis. When my patients come to me I see that their teeth are kept clean. If not clean, I make them clean them; and if not clean, I clean them before they leave my office.

SUBGINGIVAL AND ROOT CANAL RESTORATION IN CROWN WORK.*

By Edward C. Mills, D. D. S., Columbus, Ohio.

THIS method is offered to meet the requirements in those cases where the root has become extensively destroyed by caries and disintegration, and the root canal enlarged considerably beyond the requirement for inserting a dowel. To obtain free exposure of the end of the root, tightly press away the soft tissue with gutta percha, repeating the procedure at subsequent sittings, if necessary, as time expended at this step will greatly facilitate accurate adaptation (Fig. 1). After removing debris and decay, the sharp irregular edges should be carefully ground down with stones and a carborundum root facer. If sufficient portion of the edges remains, and it is desirable to use a banded dowel crown, proceed as follows:

Restore the root by use of inlay wax or modeling compound, carefully trimming and readjusting until the periphery of the root is re-established. Excess of moisture is then removed and this core secured in position by powdered gum tragacanth.

Measurement for the band is now made by using Barbour's No. 3 Irish flax,[†] the ends twisted until the thread is tightly adapted to the periphery of the root; then with a sharp pointed surgeon's shears the thread is cut closely as possible to the root. The advantage of the thread over a wire is the pliability of the former as compared with the springiness of the latter. After cutting, the ends can be brought together and, if found to overlap, can be trimmed to a butt and an accurate measurement is secured. From this make the band of sufficient width so as to permit trimming, that a portion may extend to or slightly beyond the edge of the portion restored by the core.

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*Given as a clinic at Indiana State Dental Society, 1911.

[†] Irish flax is more economical and superior to dental floss in general use about the mouth. It can be obtained at any leather supply house.

After selecting a round or square dowel of surplus length, take inlay platinum, 1-1000 thickness, and wrap closely around the pin at least twice, making a sleeve, which is carefully slipped off and the exposed edge secured with a minute particle of solder. The sleeve is now readjusted to the dowel, correct gauge obtained and, with a bur of the exact size, the canal is extended to sufficient depth. The band is now placed in position, the dowel in its platinum sleeve is coated with sufficient inlay wax and pressed firmly to place, the wax is trimmed flush with the band and all carefully removed. The band is readily slipped off the wax and the dowel from its sleeve, leaving the latter extruding through the wax model, as shown in Fig. 2.

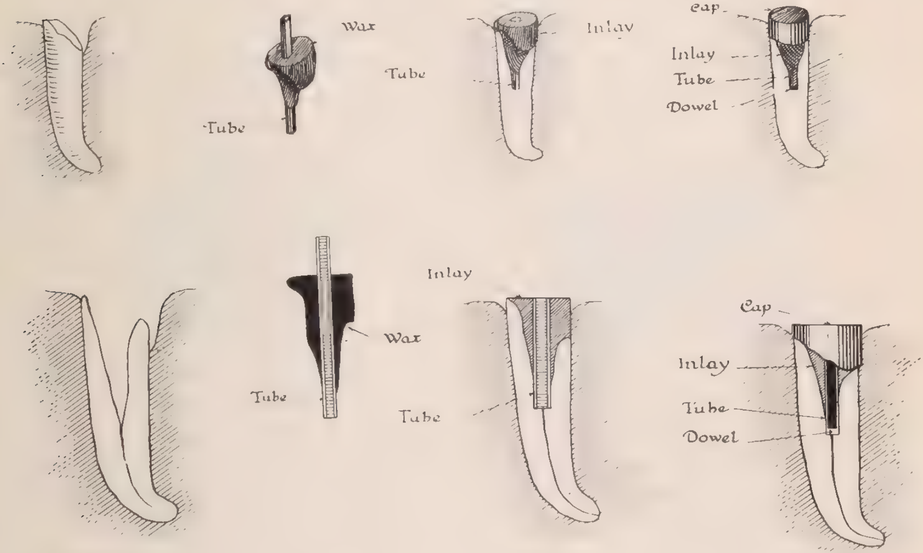

Fig. I Fig. II Fig. III Fig. IV

Place a piece of graphite coated with thin plaster in the sleeve, invest and cast (Fig. 3). After polishing, the excess length of sleeve is removed and the inlay thus formed placed temporarily in position. With the band previously made, the cap is completed in the usual manner, adapted to place on the root, perforated for the dowel at the proper point, and the latter is pushed to its place.

To sustain the accurate relation of the dowel to the cap, a piece of modeling compound is warmed and pressed against the projecting end of the dowel and surface of the cap, cooled with a spray of water and carefully detached. If the cap and dowel fail to remove, they are easily placed in their respective positions and secured by a speck of wax. They are now invested, being careful that the interior of the cap is filled with investment, and soldered (Fig. 4).

The cap with the dowel is now polished, and with the tubed inlay in position in the root, it will be found to pass snugly to place. The tubed inlay is then cemented permanently in position and, with the cap and dowel, the crown is completed in the manner desired.

In cases where a band is not desired or unavailable, due to the condition of the root, the inlay with the sleeve for the dowel is prepared at once and cemented to place.

This method of restoration reduces the amount of cement to a minimum and insures an accurate and determined position for the dowel.

SYPHILIS IN DENTISTRY*

By Starling S. Wilcox, M. D.

Lecturer on Genito-Urinary Diseases, Starling-Ohio Medical College, Genito-Urinary Surgeon to Grant and St. Francis Hospitals, Columbus, Ohio.

SYPHILIS is as old as the human race, and so prevalent that every one should be on his guard against its contagium. This admonition applies especially to professional men, who may contract the disease during digital examination or convey the germs through the medium of their armamentarium.

Syphilis, a respecter of no person, may be found in the houses of the wealthy as readily as in the habitations of the submerged tenth, constituting as it does the connecting link which binds the virtuous wife and the abandoned harlot in the kinship of a common disease.

To become syphilitic it is necessary that the healthy individual absorb the virus through a break in continuity. The point of entrance may be a brush burn, pin scratch, open pimple, cold sore, cut, hang nail, abrasion, the open mouth of a hair follicle, sweat gland, in fact any break in the skin or mucous membrane, microscopic or macroscopic.

There must be actual transference but not necessarily during the sexual act. Many cases are on record where the disease has been acquired by the handling of syphilitics. The virus may also be carried by household utensils, the mutual use of cups, saucers, knives, towels and the family shaving brush. Other objects, such as pipes, cigars, cigarettes, rubber gloves, syringes, instruments, dressings, all may be the medium of contagion. Kissing is a frequent manner of transferring the virus. Annually there is a goodly proportion of physicians who contract the disease in the pursuit of their calling, and surgeons and dentists are peculiarly exposed, as both must, during the year, come in contact with many syphilitics.

A detailed consideration of syphilis would be out of place in a paper of this kind, but it might be well to refer to a few of the salient features of the disease.

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*Read before the Columbus Dental Society, January, 1910.

Syphilis is a germ disease, caused by the spirocheta pallida, discovered in May, 1905, by Schaudinn and Hoffman. The germs are found in the chancre, which is responsible for the greatest number of infections; also, in the order of their frequency, in the secretions of the secondaries—mucous patch, condylomata and the syphiloderms—and in the blood and lymph.

The tears, milk, saliva and urine are inocuous, if not contaminated, by the blood or secretions from the secondary lesions. The semen is inocuous except that it transmits syphilis to the ovum it fecundates, and the mother may contract the disease through the placental circulation.

The development of syphilis is constant from the moment of inoculation until cure or death ends the scene, but for the purpose of clinical study the disease has been divided into four stages, the primary, the secondary, the tertiary, and the stage of the parasyphilides.

The primary stage begins with the inoculation and ends with the appearance of the skin eruption. For about twenty-three days after inoculation there is a period of outward latency, which represents the time necessary for the virus to multiply sufficiently to produce the first visible symptom—the initial lesion, also called chancre—which always appears at the point of entrance of the virus.

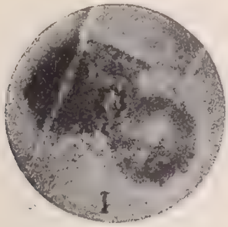

Fig. 1—Spirochaete Pallida.

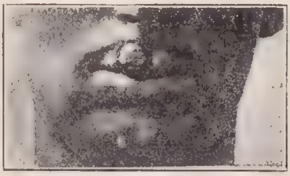

Fig. 2—Chancre of the lip.

For about forty days after the appearance of the chancre there is another period of outward latency, omitting the progress of the chancre, occasional nocturnal pains in the long bones, cranium, muscles, and later, glandular enlargement. This lapse of time is necessary for the disease to increase sufficiently to manifest itself in the form of skin and mucous membrane lesions, symptoms which end the primary stage.

The secondary stage begins with the eruption and continues indefinitely—some syphilographers claiming five years' treatment necessary to a cure. Usually a few days before the eruption appears, the glands in the neck are enlarged and, if discovered, even in the absence of other symptoms, should at once arouse suspicion.

Simultaneous with the appearance of the eruption, sometimes before, sometimes after, buccal mucous membrane lesions may be found. These are characteristic and their early recognition is of the greatest importance to the dentist and his clientele.

The tertiary stage may begin as early as the second year in precocious syphilis, or may be delayed until the third, fifth, tenth, and even the fifteenth year. This stage, characterized by lesions which are localized and destructive to tissue, consisting of infiltrations producing scar tissue and gummatous masses, tending to central caseation, may continue throughout life; or, finally, the disease may be eradicated.

The stage of the parasyphilides is characterized by sequelae or conditions which, while not syphilis, are due to that disease; among which may be mentioned locomotor ataxia, certain forms of epilepsy, arteriosclerosis, paresis, etc.

Occasional cases are reported where acquired syphilis follows contact with active tertiary lesions but, as a rule, late syphilis is thought to be inocuous. So far as I know there have been no cases reported where acquired syphilis followed exposure to any of the parasyphilides.

The syphilitic, in his first three years of the disease, whether under treatment or not, merits our closest scrutiny during this time, because he is dangerous to his fellowman. Associated lesions will now be considered in detail.

The chancres of present interest are those appearing in and about the mouth. The initial lesion, as when elsewhere located, will be the first symptom of syphilis and is found most frequently on the lips, tongue, soft and hard palate, and, rarely, upon the gums.

Labial chancre is much more common than generally believed. It is usually located upon the vermilion border, often upon both the vermilion and skin borders, then again well within the lip, or wholly upon the skin.

The chancre may appear as a crack in the lip or as a cold sore, and run an atypical course. In the absence of inflammation and enlargement of the anatomically associated glands, such a sore may attract little attention and finally disappear, to be followed later by the characteristic skin eruption.

However ephemeral these chancres may be, the patient is capable of infecting others, and the danger of mistaking them for an innocent looking crack or an herpetic eruption is great. The result of careless handling of these patients may be the spread of syphilis.

Any abrasion, sore or inflammatory spot about the mouth warrants the taking of a very careful history, and should it be discovered that the crack in the lip has lasted an undue length of time, or the cold sore refused to heal under ordinary treatment, suspicion should at once be aroused.

The general impression that the chancre must be a single sore may lead the observer astray, and it must never be forgotten that there may be as many initial lesions as there are ports of entrance to simultaneously absorb the virus.

The typical labial chancre begins as a small red spot which, changing slowly, becomes hard and raised above the surrounding surface. The hard spot usually breaks down and forms a circular ulcer which may acquire the size of a dime. In addition to the syphilitic induration there is always marked inflammation, and the submaxillary glands enlarge about the tenth day and become greatly engorged, tender and painful.

Should the chancre be located in the angle of the mouth it will appear as two half circles, one on the upper lip, the other on the lower. The margins of the typical chancre are clean cut, not undermined as in chancroid, and the base is smooth, shining, destitute of granulations, and secretes but a scanty serum. If there be undue irritation and some other infection also present the secretion increases, taking on the characteristics of pus formation, and the typical sclerosis of the base, which normally is well defined, becomes lost in the inflammatory infiltration.

Herpes labialis (cold sore) differs from chancre inasmuch as it is characterized by the formation of pin-head sized discrete vesicles arranged in groups. The appearance of herpes is preceded by slight burning, tingling and itching, and a feeling of tension; there may be a chilly sensation. The point of election becomes swollen and there appears suddenly a group of papules which, in twenty-four hours, are converted into vesicles whose contents are clear at first but, subsequently become more or less milky or puriform. The vesicles stand close together in groups of six to twelve, forming one irregular patch. There is no tendency to spontaneous rupture but, should they be broken, a superficial excoriation results. The eruption responds kindly to treatment, shortly dries up and disappears, and is not followed by glandular enlargement.

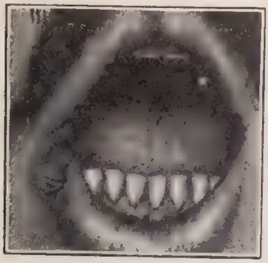

Fig. 3—Chancre, right angle of mouth.

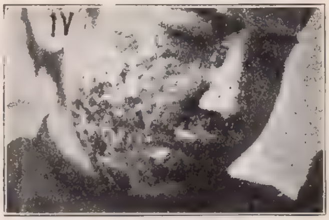

Fig. 4—Lupus of face.

The labial chancre may be mistaken for epithelioma and lupus.

Epithelioma usually affects the lower lip as a persistent crack; it may, however, appear as a small reddish, yellowish or pearly papule or tubercle. Whatever its beginning, its long existence is in marked contrast to the life of the chancre, which rarely lasts over six weeks. After the epithelioma has existed for some months the formation yields to degenerative action and there results surface ulceration. After the lesion has sunken somewhat below the skin level, it is commonly observed to have more or less elevated, waxy, ragged edges. There is variable infiltration which shades off gradually into the surrounding tissue, whereas typical chancre induration has abrupt, well defined borders. The malignant ulcer has an offensive discharge, often streaked with blood. Epithelioma is not followed by glandular enlargement in ten days.

Lupus, due to the invasion of the integument by the tubercle bacillus, begins by the development of several pin point sized deep seated, brownish or yellowish tubercles, having their seat in the deeper part of the corium, and are softer and looser in texture than normal tissue. The most common site for the manifestation of lupus is the region of the nose. As the disease progresses by new lesions, the original nodules, having attained a certain size, remain stationary for a time, then from retrogressive changes, ulcers form with rounded, shallow excavations having soft brownish-red borders. Later, as the ulcers heal, cicatrices form. Cicatrices never follow uncomplicated chancre, a diagnostic point of value. Then, too, the long life of lupus manifestations is in striking contrast to the comparatively short existence of chancre.

Lingual chancre is almost invariably a single sore, situated upon the anterior half of the organ, and usually near or upon the tip. It is either an ulcer or an erosion of oval or rounded form, with induration, marked only when the tip is the part involved. Though at times deeply seated in the tissue and capable of leaving extensive fissures (which heal later) the ulcer is more often superficial and of small diameter. Rarely the entire tip may be involved, or the under surface of the tongue, alongside the frenum or near the border, may be the site of an erosion or ulcer, showing some induration at the base. Sclerosis is generally present but difficult to determine on account of the texture of the tongue. The borders of the chancre may be typical, but in the scooped-out variety of chancre they usually slope inward to the base. In the smooth, flat, ulcerative and erosive varieties, with rosy or perhaps opaline base, the coloring shades off gradually into the surrounding tissue, and an abrupt border can not be seen. The lingual chancre is followed in about ten days by enlargement (adenopathy) of the subhyoid and submaxillary glands. Lingual chancre may be mistaken for cancer and the ulcer of tuberculosis and various tumors.

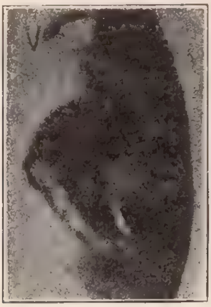

Fig. 5—Chancre of tongue.

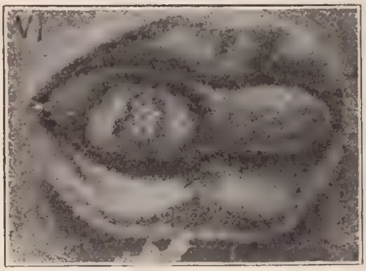

Fig. 6 Chancre of tongue.

Cancer of the tongue, nearly always of the epithelial type, begins as a papillary outgrowth, an indurated nodule or a fissure, or as an ulcer. The tumor tissue is characterized by hardness, infiltration of surrounding tissue, and immobility. The base of the ulcerated surface is uneven, ragged, fissured and furnishes a greenish-gray necrotic, offensive deposit. The borders of the tumor are indistinct, shading off into the surrounding tissue. There is marked increase of saliva, and hemorrhage from the surface of the erosion is common. Unlike chancre, the process spreads to the gums and pain is felt radiating from tongue to the ear.

Tubercular ulcer of the tongue is always painful, decidedly more so than chancre; shows more irregularity in outline, is often studded with fine granulations springing through a pink, yellowish or grayish-yellow floor, and may present the miliary yellow points, showing tubercles in the course of development.

Tumors of the tongue are ranula, lipoma, papilloma and cysts.

Ranula occurs beneath the tongue, to one side of the frenum, between the tongue and jaw. The tumor is thin-walled, rounded, pale red or bluish in color, translucent, and covered by tense but normal mucous membrane. The contents of the tumor resemble the white of egg, rarely yellow or brown.

Lipoma is a rare tumor. The growth is sessile or pedunculated, occurring on the dorsum, borders or tip, or it may be imbedded in the tongue substance.

Papilloma is a small sessile or pedunculated, rough surfaced tumor, usually seen on the dorsum, and may attain the size of a hazelnut.

Cysts occur beneath the tongue in the floor of the mouth, etc., as small translucent, bluish, bladder-like elevations, containing clear, stringy mucus.

The various tumors of the tongue rarely give rise to pain, and their long existence without prominent symptoms beyond their presence precludes chancre.

(To be Continued.)

ROOT CANAL TREATMENT AND FILLING.*

By J. R. Callahan, D. D. S., Cincinnati, Ohio.

I HAVE accepted the invitation of your committee to read to you a paper on root canal treatment with some hesitancy, because I feel that it will be impossible for me to bring any point to your notice with which you are not already familiar.

Those of you who are acquainted with my own personal efforts in this line recognize the fact that the central idea has been the placing of the root canal and the surrounding tissues in such a condition that they may be under the direct influence of the medicaments that we may think best to apply, after having taken into account all the conditions the case may present, both general and local. For the general physical condition of the patient often influences the line of treatment to a very marked degree, so if you ask how to treat and fill root canals, the intelligent operator will ask to see the case. As we cannot at this time have the case before us, we will, with the assistance of a few hypothetical cases, endeavor to discuss what seems to us some of the most important features of this work.

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*Read before the West Virginia State Dental Society.

Before taking up the cases let me devote a few lines to what we believe to be the proper preliminary preparations prior to the opening of the root canal. We believe that if asepsis is necessary in any surgical operation, it is, in proportion to its gravity, a necessity in this. The use of napkins, paper points, cotton, broaches, burs or anything that is to come in contact with the tooth, should be sterilized as perfectly as it is possible.

All the instruments and supplies we have mentioned, directly or indirectly, should be taken from the dusty and oftentimes mussy drawers in which they are kept, and placed on a wire tray in a modern steam and hot air sterilizer. After being exposed to superheated steam as long as may be desirable, the steam is shut off. Hot dry air then is turned into the sterilizer long enough to thoroughly dry the chamber and the instruments and supplies.

The wire tray may then be placed on the bracket where the instruments and supplies will quickly cool, and they should be used directly from the tray. While this sterilizing is being done the rubber dam is applied. In some cases napkins held in place by one or more clamps will answer, but the rubber is far more safe and desirable. Then all the exposed territory is bathed—I may say, flooded, with absolute alcohol. We are then prepared to proceed under aseptic conditions. Yet we are aware of the fact that many successful operations have been made without the preparation here described.

When the region is in what is known as an aseptic condition, by what method chosen so it is thorough, we are ready to proceed with the case.

Case 1. Patient about thirty years of age, in fairly good physical condition. A single-rooted tooth from which all pulp tissue has been removed with the broach, after an application of arsenical paste or cocain. To prevent a change of color in the crown, all traces of blood should be removed from the root with a solution of sodium chloride or common salt.

If the history of the case be favorable, there having been no indication of irritation about the apex, and after repeated examination with fine paper points, and there is no sign of hemorrhage, then a 40% solution of sulfuric acid should be placed in the canal by means of cotton fiber or broach, followed by a Donaldson broach being worked up and down the canal in order to carry the acid solution to the end of the root; also to smooth the walls of the canal and break down any minute cells or pulp fragments that might be present. The canal being still filled with acid, then, by means of a small syringe, inject into the canal a saturated solution of soda bicarbonate. Instantly all debris will be forced out of the canal by the resultant carbonic acid gas, leaving the pulp walls smooth and sterile. Remove the moisture by means of paper points.

The canal is now filled with chloroform to the apex and kept filled with the chloroform for several minutes; then removed by paper points, and further evaporated with hot air and heated silver wire; not red hot however. Then fill the canal with white chloro-percha and fine pink gutta-percha point, using white chloro-percha to preserve the color of the tooth and pink cone to show better in a radiograph, if one should ever be desirable.

It will be wise at some subsequent sitting to cut out the gutta-percha as near to the apical foramen as possible without disturbing the gutta-percha at the apex. Then fill the canal and chamber with oxychloride cement.

Case 2 may be represented by a single-rooted tooth, sore on pressure and accompanied by throbbing pain; little or no swelling in apical region. The tooth should be tapped on lingual surface, unless there is a large cavity on some other surface. Make the opening into the chamber large enough to permit direct access into the canal. Do not permit anything to make pressure toward the apex sufficient to force a part of the canal contents through the apical foramen. After searching gently with the finest broach for pulp fragments, partially drying the canal with fine paper points, place within the chamber a shred of cotton loosely, and on this place a drop of formocresol. Over this flow a very thin cement. Be sure the cement will flow. Any pressure in the canal at this stage will interfere with a speedy cure. At the next sitting, about the third day, it most likely will be ready for some treatment, and filling is advocated as in case one.

Case 3. We have a root anterior to the molar region on which we wish to place a porcelain crown. At first appearance the face may be swollen, or there may be a fistulous opening of long standing. Careful examination shows that all the bone tissue about the root apex is affected; pus in abundance. Patient appears anemic, run down; flesh clammy; oral secretions vitiated. From general appearance the patient might be diabetic or tubercular; secretions and elimination below par.

The first step in treatment will be to establish free drainage, both through the root canal and through the fistula. Make the openings large enough for the free and easy passage of liquids through the diseased region. Then flush the canal and pocket, first with dioxygen to free the parts, more or less, of dead or diseased debris, so that the injected mercury solution that should follow may be more effective.

It may be wise to pack the fistulous opening to prevent it closing. At this time the patient, as well as the local parts affected, would profit by a twenty-four or forty-eight hours' rest. At the next sitting the nature of the treatment would depend entirely upon conditions, local and general. If local conditions had improved it would likely be good treatment to pump into the pus pocket through the root canal the sulfuric acid solution, to be followed by soda bicarb. solution.

If, after this treatment, the root canal can be gotten thoroughly dry, the canal and the bone pocket should be filled with chloro-percha and gutta-percha cone or cones, forcing these materials through the fistulous opening. The case may now be given a month's rest.

At the end of this time many cases will show a complete recovery; but if pus conditions still prevail, proceed at once, under local anesthesia, to open through the gum and amputate the end of the offending root. Curette away all the diseased bone; pack the wound, and give it the usual after treatment, preserving the most rigid aseptic conditions possible.

At the first treatment the patient should, most likely, have been put on iodide potassium treatment, and kept on said treatment to the end of the case.

Especially you will need to undertake to prevail upon patients to indulge in large quantities of water: drink all the water they can; but of course common sense should be used in these things. There is not one American out of fifty who is up to par in water in his system. You all know you should have from 95 per cent. to 97 per cent. of water in your system; dentine 11 per cent. and enamel 4 per cent. If the patient is 10 per cent. short on water in the general system it would affect the mouth just the same as any other part of the body. It is a difficult matter to prevail upon a patient to drink enough water. Faulty elimination, secretion, anemia, etc., would be affected quicker by an abundant supply of water than any other way. Water is the only thing that will permanently cure constipation, and will do it in almost all cases where there is no organic disease.

Case 9 embraces all molar cases. The treatment of root canals in molar teeth is fundamentally the same as the treatment of any of the anterior canals, but the details are more complicated and difficult on account of size, shape and location of the tooth roots.

The cases before mentioned were those from which the pulp tissue, as a rule, could be removed with the broach. We now come to the consideration of cases where the pulp is seldom removed wholly by instrumentation. When removing pulp tissue from an inferior molar, only in rare cases does the pulp come away from the anterior roots, and the same may be said of the buccal roots of the superior molars.

The lack of effort to treat these root canals has caused an enormous amount of pain and sickness on the part of a trusting and long-suffering public. There are but two, to my knowledge, out of an army of dental writers who do not ignore the difficulties of this class of root canal cases.

Placing certain drugs within the pulp chamber and sealing them there will help some. Then they say, "Fill the canals to the end." That is good so far as it goes. But what we want to know is, how do you get to the end of those small, crooked canals? And if your medicaments *are* effective the entire length of the root, how do you close these hair lines effectively? Furthermore, if these canals are not sealed permanently, what is the good of treating them at all?

I wish it were in my power to give you satisfactory answers to these and other questions that I know present themselves to you in rapid succession. My message to you is that the per cent. of unsuccessful treatments in these cases can be reduced one-half, at least. Fifty per cent. to the good is worth an effort.

When we cut away the crown of a molar sufficiently to expose the entire floor of the pulp chamber, and can see plainly the mouth of every canal—or, it might be well to say, see where we think they should be—if then we are confident or reasonably sure that all the pulp has been removed, and there being no pus in the canals, our next endeavor should be to so shape the canals so that whatever is afterward put into them will meet with little or no obstruction in going directly to the apical foramen.

To this end we would place the sulfuric acid in the pulp chamber and, in the presence of the acid solution, endeavor to work a No. 5 Donaldson broach as deep into each canal as it will go without binding.

One of the most important features of the sulfuric acid treatment is that it forms an opening large enough to form a guide for the drill.

Enlarge the canals by using larger broaches. After a few minutes of this treatment it may be well to neutralize the acid with soda solution and dry the cavity with alcohol or chloroform and hot air.

The position and condition of the canals can now be seen quite plainly. At this time the mouth of each canal should be enlarged and made cone-shaped, using such drills and reamers as the case may indicate. The acid and broach have prepared the way sufficiently to start the drill in the right direction. It will be wise to stop the drill before it reaches the depth to which the preceding broach has opened the canal.

The acid and broach treatment should be renewed at this time. Penetrate to the foramen if possible. If successful, the canal, after drying, is ready for filling. If, on opening the chamber, or at any time during this procedure, all or part of the pulp tissue remains in the canal and cannot be readily removed with the broach, place a small portion or piece of Schrier's sodium potassium over the damp pulp tissue. This will, in a short time, convert the devitalized tissue into a soapy mass that is readily removed with a stream of water, when the enlargement of the canal may be taken up as suggested above.

ABSTRACT OF DISCUSSION.

Dr. I. W. Hutchinson, Parkersburg: I just want to say, in regard to this work that Dr. Callahan has brought forth in his paper, that up to four or five or six years ago I didn't attempt very much to save teeth. I attempted to treat teeth, but I was just a dilettante at it. At last I came to realize that I was not only losing the respect of my profession, but the respect of my patients, and I began to square around—I just simply make this in explanation. I think it will help me, and some of the younger members of the profession, as well as the older.

I want to say this in regard to the treatment the doctor has set forth in his paper —I have not tried to use this acid treatment very much, but in some extreme cases I have had I found I could get these openings so much easier, and I began to use it more and more in my practice. I feel one reason why younger fellows make these mistakes is we are afraid to do these things. As a professional man, I do not want to be afraid to go forward in this work. I have in mind a patient I had some time ago. It is very vividly impressed on my mind because I made a failure, and it seems to me that it is through our failures that we find and eventually reach a higher professional life. I devitalized this tooth with arsenic and left the arsenic in for something like two or three days, and the young man came in and I removed the pulp in the usual way; there seemed to be some sensitiveness at the extreme point, so I closed it up and used a dressing in it that Dr. Buckley has given in his instructions in this matter. I have been trying to follow Dr. Buckley's instructions the best I could. The young man came in the next day with his face swollen, and I tried again to open up the root and placed some more dressing in there, but I couldn't seem to get at the trouble, and after two or three days I had to extract the tooth, as it had gotten loose.

Then I had another case some time ago—the anterior root of a lower molar. I tried to make this a success, as the friend who had sent the patient to me was very anxious that I should do the proper thing for this man. He was a man about forty or forty-five years old, and had considerable bridgework, crowning, etc., to do. I opened the tooth up in good shape and tried to fill it, and I did fill it, but in the mesial root I couldn't get any opening whatever, so finally, in my desperation, I closed it up. He came back in two or three days with his face swollen and I tried to open the tooth again, and seemed to get some opening, and finally he went away and I never saw him any more, and I understand the other fellow got the money and I was placed in disrepute. That is failure No. 2. I have made failures, but by persistent and constant concentration of our efforts along the line followed out by the doctor and others, especially what Dr. Callahan has given us here this morning, I know our failures will grow less.

It is through our experience that we live, that we do our best work. I want to thank you and thank this society and our men generally for the encouragement they have given me.

Dr. W. T. Jackman, Cleveland, O.: I unfortunately did not hear the doctor's paper, but I have heard him discourse on this subject before, and have come to know that what Dr. Callahan has to say on root canals is about the right thing. If you follow his directions you will not go very far amiss. We know him over in Cleveland as "Sulfuric Acid Callahan," yet he is not dangerous at all.

I want to thank Dr. Callahan for giving us sulfuric acid for opening up obscure root canals. It is one of the best things of the kind in the practice of dentistry, and using it as he directs you will get out of many difficulties. Now, canal treatments differ, of course; we each individually have our own method of putting canals into an aseptic condition for filling; personally I use the Buckley method after I get the pulp removed; but I wish particularly to warn you against the over-use of tri-cresol and formalin, which is the Buckley method. I had occasion to go to a dentist the other day myself. I had a bridge removed, and we found the pulp canals were in very bad condition, indeed, and the dentist to whom I went opened up the canals very carefully, and before I knew it he had flooded those canals with tri-cresol and formalin and said, "I don't have the success with using this remedy that other doctors have. I have a great deal of apical soreness." You don't get your results from the using of this material in solution; that isn't what it is for; the gases do the work, and you must not let it touch the soft tissue at the apical foramen, but just moisten your cotton and put it down there, but not enough of it to pass down in any way whatever to the end of the canal, but seal it in there and the gases will do the work and do it more effectively than any other way I know of, and you will seldom if ever have any soreness of the tooth. I have better success in that way than with any other material that I can use for that purpose, because you know we have no antiseptic that is more powerful than formaldehyde or formalin, as it is used in our work. Two or three treatments in some of the very worst cases are all that are necessary, and you get an aseptic condition that permits you to go on and fill the canal and know you are going to have perfect results.

This question of opening up canals is always a serious question. In lower molars the mesial roots are the ones that cause the most trouble. We must try to get to the apical end if possible, or get as near there as we can, and there is no way I know of that we can do this better than with sulfuric acid.

Dr. H. C. Brown, Columbus, O.: Mr. President, members and guests of the West Virginia Dental Society: I think this society is very fortunate in having with it today Dr. Callahan as an exponent of this sulfuric acid treatment. Not only the profession of our state, but the profession generally, realizes that he has done a great service in this particular. One case that he referred to was one having a fistulous opening where he was unable to accomplish the desired results and he amputated the root and curetted the parts. I get at that from just the opposite direction. I find that there are a great many of those chronic cases that can be cured, or we can get the desired results by first curetting, and then if we fail in curetting we can afterwards amputate. I believe that the surgical side of the chronic abscess is one that demands more attention than what we have given it, and we are saving teeth now that formerly were extracted, because we were unable to cure the abscess by medicaments alone.

Dr. C. H. Skaggs, Hinton: I do not think of anything that I can say in addition to the discussion of Dr. Callahan's paper. I heard Dr. Callahan on this subject about two years ago at the meeting of the National Association at Birmingham, and his methods of treatment have been very interesting to me each time. We are very glad, indeed, to have him with us.

In regard to the use of formalin in treating putrescent canals, I will say that a short time ago while treating a lower six-year molar I forced the treatment through the apical foramen or near enough to the tissue at the apex of the roots to cause considerable soreness. My experience has been, as Dr. Jackman stated, that you get better results by simply placing the treatment in the pulp chamber without any pressure and with but very little of the formalin.

Dr. J. R. Callahan, Cincinnati, O., (closing): The last remark that the president made reminds me, and I mention it merely that it may be of some encouragement to others who are interested in this line of work, that for years I have been receiving a great many letters from all parts of the world; letters of congratulation and letters of inquiry, etc., and, in fact, on my desk now are three or four European letters I must answer in relation to this treatment. It seems that a great many men are successful with it.

I have no objection to the use of any other method for the preparation of root canals, so that it succeeds, I do not care what it is. The sulfuric acid solution spoken of is very good, being about 15% acid in the cases you recommend it; but where I have already flooded the root canal with a 40% sulfuric acid solution I do not see what purpose the further dosing of the canal with sulphocarbolic acid will serve.

The sterilization is incidental and very useful, and after the sulfuric acid is in the root canal I do not see that there is any further use in trying to sterilize the canal, but sterilization of the tissues beyond the canal is entirely another proposition, and I speak very briefly of all cases of that kind because an entire paper should be devoted to that point. The medical profession and the world at large are going to drive us to a more careful treatment of the bone and tissues beyond the tooth. They very frequently become poisoned, and all the tissues becoming thoroughly saturated with poisonous elements, the thing is to get rid of it.

To the gentleman who opened the discussion permit me to say. I always admired a man who is not afraid to talk about his failures. I have lots of failures. I see cases that I cannot, by any possible means, cure. If I have a case where, under the conditions I do not think I can cure, the bone is affected, a copious supply of pus, and I am afraid to leave it in any longer, I immediately have the tooth extracted. I do not hesitate to extract a tooth if it is going to give trouble, or if I suspect tubercular or diabetic or syphilitic conditions.

This tooth that was handed me is a very peculiar case and has a foramen as large as any I ever saw. You ask me about that particular case, what I would do with it—I would not have known the foramen was in the condition it is until I got down to it, but I would undertake to save the tooth, and when I found there was an opening at the end of the root—depending largely on the case—I most likely would undertake to fill that with chloro-percha, being very gentle, or possibly balsam peru, and make a cone that would fit down gently. I would try to close it up along those lines. I have had several of this kind. I saw a lady the other day who had a superior molar in a condition like this, and I had closed the root canals in 1887, and it is still there and doing good service. I forgot to mention that I filled those canals, after I had removed all the septic conditions, with a very thin paste made of oil of cloves and iodoform, and that is there today; and this has been a habit of mine in a certain class of cases. Iodoform, it is said, is not an antiseptic, but the fact remains that the most recent German surgical work advises the use of iodoform in certain surgical cases, and says that while iodoform cannot be classed as a true antiseptic, yet the pathogenic germs never flourish in the presence of iodoform. So in a case of that kind I would be very apt to fill it full of iodoform and glycerine, or clove oil, close the canal very gently and take my chance. Now, the placing of the formalin or formal-creosote in the root canal is very excellent. It has not been the intention to use formalin in contact with the tissues; it is simply the evaporated formalin. Dr. Buckley is very careful to speak of placing a dry piece of cotton in the root and place the formalin on the end of that, thereby getting the evaporation or the gas. Formalin is a gas, 40% in water, formaldehyde being the gas and the rest being water, that makes it commercial, so the water is simply the vehicle for carrying the gas, and the heat of the mouth very quickly liberates the gas. I said in my paper that I do not think it is always necessary to use formal creosote. Dr. Buckley says that tri-cresol is to eliminate some of the irritating effects of the formalin. If you take a small piece of cotton and dip it in formalin and then dry it thoroughly in a napkin, then hold it to your nose you will find there is a lot of gas there; and if you seal that comparatively dry piece of cotton in the root canal, and open the canal in a week or ten days you will find some of the gas is still there. There is plenty of formalin on the cotton to do the work. Buckley's is a splendid work on root canals, and every dentist ought to have that book in his library and study it. I say the same of Dr. Printz's work along the same line. In sealing these dressings in a root canal many have been ruined just in that simple act of undertaking to seal a dressing in a canal, especially the first time. The only perfect way to seal them is to prepare a hydraulic cement and make it thin so it will flow over the opening, and then put a drop of water on it and keep the patient's mouth open two or three minutes. You will find it sets sufficiently hard so that when they come back you can take it out with a bur, and you have sealed the dressing in there tight without making pressure.

In relation to opening canals and using broaches and drills, etc., I have never been able to get many of my friends to understand what I mean. Many seem to want to know and I am sure I want to know what every other man means. I will go a long way to see what a man means, and I have done that many a time, gone away from the office for a week to find out about a subject that I did not understand, and it does me a lot of good.

In opening a fine root canal if you will take the finest of boidlerock drills, put it in the right angle, but before you start the engine set it carefully on the right spot; in a great many cases it will drop into the canal. You might break it off, but if you do that is your business. But they usually break off over the shank. If you do break off a drill, drop some sulphuric acid into the chamber, then bicarbonate of soda; don't try to pick at it, but without touching it at all except with the acid and soda solution, and in 75% of the cases it will lift it right out. But if it gets locked in the canal take crystals of iodine and seal in the canal and have patient come back in a few days, and you will find that it has turned that steel into a soft mass. That is something that is a help. If the fine drill starts into the canal ever so little, that is a start; then you can get your broach down, and you can get a larger sized drill and enlarge it a little more. We should pay no attention to consumption of time; it is the preparation of that root canal that is the important thing. The reason we do not often devote time enough to it is because 95% of us do not get paid for treatment. If you do not get paid for it that is your own personal fault. If you live in a small town and other fellows do not do it, that is all right, but explain it to your patients; everybody is willing to pay for anything that is worth while. If you cannot make yourself worth it, it is up to you. If after opening a canal with acid and broach you will use a Gates Glidden drill, a very small one, you have made a little cone-shaped opening so that when you put a medicament into that cavity it drops right into that place. Work at it a little longer until you enlarge it sufficiently, then you can use other instruments, endeavoring all the time so to cut that canal that it will be shaped on the general lines of a funnel; then if you put any medicine into the canal it goes right where you want it. In the use of filling for root canals we use gutta percha points. I have seen so many of my good friends pick up root canal points off of a dusty table or out of a dusty drawer (possibly it had been lying there for months), and stick it right into the root canal without any sterilization whatever. That is malpractice. If a surgeon or physician should come into court and testify in a case like that he would say it was malpractice.

I have spoken of administering the iodide potassium, which, as you all know, is a very powerful alterative, and yet there are some in which it will cause stomach disturbances and skin eruptions. We should be very careful in the administering of iodide potassium. About the second day you will see things improve so positively you will wonder why you didn't use it before; but it is recommended that the iodide potassium be given in milk or sarsaparilla. Three to five-grain doses will answer the purpose very well.

What I speak of as mercuric solution is a mercury solution manufactured by Parke, Davis & Co. I have one of the circulars that comes around the bottle here. One of the surgeons who made an operation on one of my arms used it to sterilize his hands and his instruments. After the instruments had been boiled they were laid in a tray filled with this solution. It comes under the name of Germicidal Discs, McClintock's formula, mercuric iodide ⅜ grain, sodium bicarbonate 16 grains, and potassium iodide ⅝ grain, and supposed to be several times the power as a disinfectant as mercurial bichloride, and there is no trouble about its tarnishing steel instruments or nickel plate or anything of that sort, and it makes it much more desirable to use that way. Germicidal Discs, manufactured by Parke, Davis & Company, I think is a very convenient thing to have about the office. It has been a satisfaction to me.

As I said a moment ago, in canal treatment we have all gotten into the habit, more or less, of trying to do these treatments for nothing, or next to nothing, and I do not know of anything that is so lowering to the professional man in the mind of the community as to work half an hour or an hour, as the case may be, on any sort of treatment, and then say, "I won't charge you anything for that." He knows he is making a fool of himself, and not only that, but he is creating an impression in the mind of that person that you know your services are not worth anything, so you could not charge for them, and therefore you are just a common dentist.

With many persons, their greatest fault is their inability to estimate values. The best wisdom is to know what is worth while and what is not.—Frank Crane.

THE RELATION OF THE TEETH TO THE DEVELOPMENT OF THE JAWS AND FACE.*

By Frederick B. Noyes, B. A., D. D. S., Chicago, Illinois.

IN CONSIDERING the structure of all multicellular organisms, and, in fact, in the very simplest aggregations of cells into tissues, it becomes apparent that there are two essential parts: the cells, which are the vital units; and intercellular substances, which give the physical characteristics to the tissue. The latter are always material which have been produced by the vital activity of the protoplasm, but which are not living matter; that is, they have no vital properties but are dependent on the protoplasm for formation and for the maintenance of their chemical character. In tissues, the vital characteristics are given to the protoplasm by the cells, the physical characteristics by the intercellular substance. Protoplasm, which has long since been recognized as the physical basis of life, is always of a soft and more or less gelatinous character, and of it alone, nothing resembling a highly organized creature could be formed. Other substances, therefore, have been produced by the protoplasm for the purposes of protection, support, rigidity and strength. Always the protoplasm is the active agent by whose chemical activity the protecting or supporting substance is formed. There are two types of formation. The first consists of cells which develop substances inside of the protoplasm to give rigidity or strength. This class is illustrated by certain cells found in the lobster and other similar creatures, but this type of supporting cell has apparently proved insufficient or not adapted to higher developed forms. In the other type the protoplasm develops, on its surface or about it, formed materials which give protection and support, either in the form of rigidity, or strength, or both. The simplest example of this class is found in the cell walls of plants.

It is important to note that the necessity for physical properties which are impossible for protoplasm itself is the cause of the appearance of intercellular substances.

In the very beginning of evolution, therefore, physical conditions and necessities led to the formation of substances by the protoplasm which gave it support and protection. In the higher animals certain tissues have developed such materials for the support and assistance of the more vitally active tissue, and therefore have been called the supporting or connective tissues. In these tissues the cells form and maintain materials which give qualities of strength and rigidity to the tissue and enable it to serve as the framework of the organism. The intercellular substances have been called into existence to meet physical and mechanical conditions. The connective tissues are the most adaptable of all tissues and respond most

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*Read in the section on stomatology, A. M. A., of which the SUMMARY is the representative organ for the dental profession by special arrangement with the *Jour. Am. Med. Asso.*

quickly to conditions of environment. The mutation of these tissues or their power to change from one variety to another is their most striking characteristic. The cells control the intercellular substances to form more, to destroy what has been formed, or to change its character; and their activities are excited in response to physical or mechanical conditions.

In the process of growth and function they are continually changing.

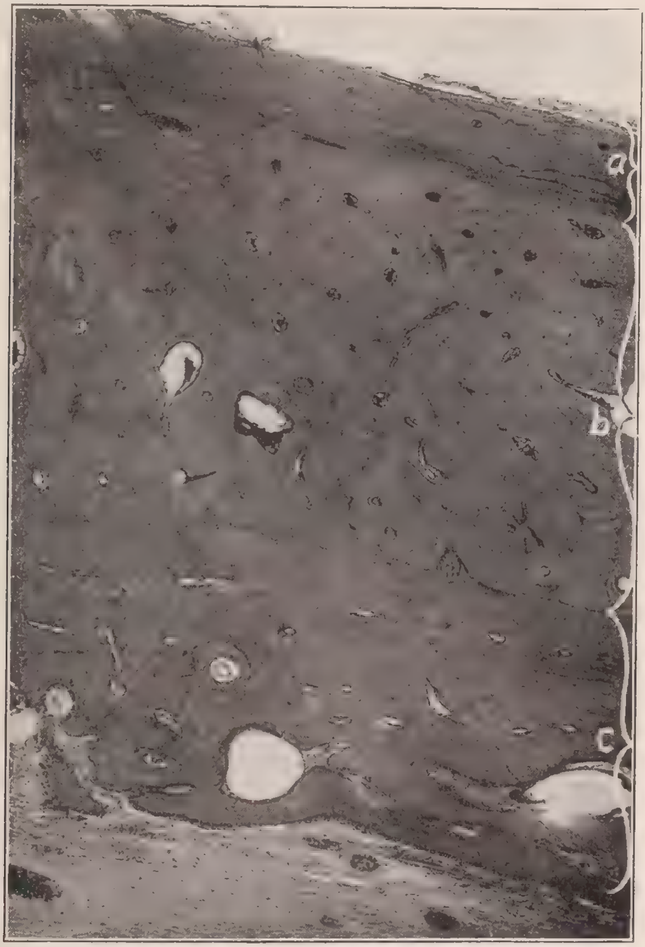

Fig. 1. Buccal cortical plate of mandible of sheep; a, subperiosteal bone; b, Haversian system bone; c, rebuilt bone of more cancelous character.

Embryonal connective tissue develops into fibrous tissue, fibrous tissue into cartilage, and cartilage into bone. In bone, which is the highest form of tissue for rigidity, mutation is the most striking characteristic. It may be formed from fibrous tissue directly or through the medium of cartilage, and it always retains a large amount of cellular elements which can at any time destroy and reform the intercellular substances. In fact, bone should always be considered as a fibrous tissue which has developed in itself intercellular substances of a different sort to meet special mechanical conditions. In other words, there is always in contact with the calcified intercellular substance of bone, on its surface and in spaces within it, undifferentiated connective tissue, the cells of which are capable of developing into any sort of connective tissue cells. It is the presence of these embryonal cells which makes bone a plastic tissue. There are three varieties of bone: subperiosteal, Haversian system, and cancelous. In other papers I have emphasized the characteristics of these classes, and I assume that all are familiar with the minute structure of each. At present I wish to emphasize the transformation from one variety to another that occur in growth and which are in fact going on continually throughout life under the influence of mechanical conditions.

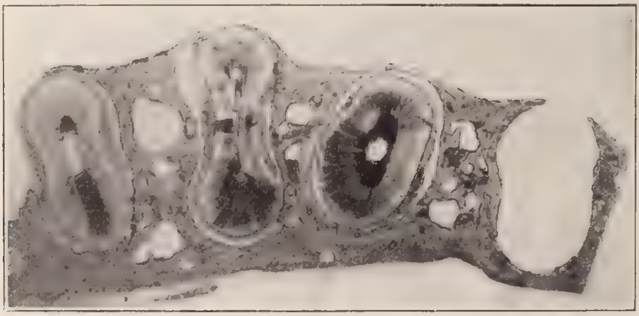

Fig. 2. Transverse section through the alveolar process and the roots of the first and second bicuspids and first molar teeth; the buccal plate above, the lingual plate below; the alveolus of the first bicuspid, to the right, empty.

In bone showing subperiosteal bone on the surface, a portion of compact or Haversian system bone, and cancelous bone beyond, if this bone is growing in one direction subperiosteal bone will be laid down in layers parallel with the surface. When a certain thickness has been formed large spaces or canals will be absorbed out of it, forming what are known as Haversian spaces and around these concentric layers will be laid down, converting them into Haversian systems. Only enough compact bone is formed to meet the mechanical stress of the position. As soon as an excess has been formed absorption begins in the Haversian canals, cutting out large spaces around which a few lamellae are formed, producing cancelous bone. If the bone is growing in the opposite direction concentric layers will be laid down around the spaces of the cancelous bone, making it more compact and large absorptions will occur under the periosteum, cutting deep into the Haversian system bone, after which a few layers of subperiosteal bone will be added to the surface. In such absorptions the entire surface is not attacked at one time, but in one area there will be a large absorption, while in an adjoining there is a slight rebuilding.

Figure 1 illustrates the first type. It is a section of the buccal cortical plate of the mandible of a sheep. On the surface is shown a little subperiosteal bone in which only one or two Haversian systems have been formed. Next is seen the Haversian system bone which has been destroyed from within and rebuilt with bone of more open structure. The first type of growth occurs in the direction toward which force is being exerted; the second type occurs on the surface from which force is being exerted. It may be stated as a generalization that the bone is more dense, but less in amount on the side toward which force is exerted, and greater in amount but less dense on the side from which force is exerted. These generalizations become important in orthodontia. These conditions are illustrated in Figures 2 and 3. Growth has been progressing toward the buccal side. In other words that is the direction toward which force has been exerted, and the compact bone is less in amount, more dense in structure, while on the lingual side it is greater in amount but less dense in structure.

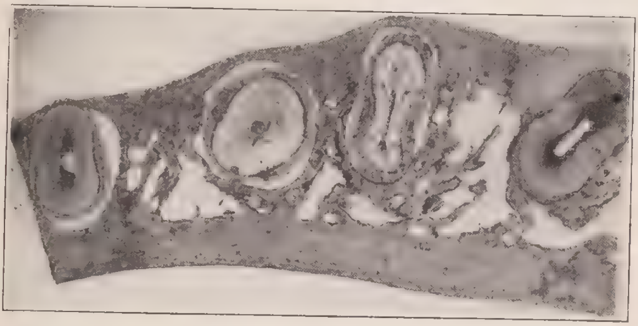

Fig. 3. Transverse section deeper in the process; the buccal plate above, the lingual plate below, the first bicuspid to the left.

Professor Cope, in a long article,[1] elaborates the idea that the bones have developed in response to mechanical conditions, that the form, size and structure are the expression of adaptation to mechanical environment. He treats the subject entirely from the evolutionary standpoint. If we consider the subject from the standpoint of the development of the individual we are led to similar conclusions, and become more and more impressed with the fact that bone is formed in response to mechanical stimuli. This is true of the bone as an organ, and equally true of the minute structure within it.

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1. Cope, E. D.: The Mechanical Causes of the Development of the Hard Parts of the Mammalia, *Jour. Morphol*, 1888, iii.

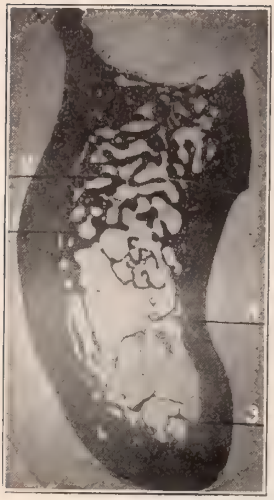

Fig. 4.—Section of human mandible between second and third molars.

Some years ago, Walkoff, in an elaborate study of the jaws by radiographs, showed that the direction and character of the spicules of cancelous bone within the substance of the bone are not the result of chance, but that their direction and arrangement were determined by the forces to which the compact bone of the cortical plates was subjected. If we examine sections of the mandible we shall find that not only is its general form determined by the mechanical conditions to which it has been subjected, but the cancelous bone is being continually reformed to adjust it to the stresses received on its surfaces.

Figure 4 is a decalcified section of a human mandible which was made to study the arrangement of the lamellæ as a record of the growth of bone. The subperiosteal layers are very few at almost all parts of the section. The cancelous bone in the alveolar region has been built and rebuilt to support the cribriform plates forming the walls of the alveoli for the roots of the molars during their movements in development, and the record of this rebuilding is left in the arrangement of the lamellæ.

Figure 5 shows a field from position 1, Figure 4. Notice how plates have been cut off and built on with layers in a new direction and how additions have been made at different times.

Figure 6 is taken from position 2, Figure 4. These spicules are a regular patchwork. At *a* is a bit of old spicule which ran in an entirely different direction, and there is another at *b*. These changes have not been the result of chance, but each new formation has been the response to some mechanical stimulus received through the substance of the bone.

Figure 7 is from 3, Figure 4, and shows the rebuilding that occurs during growth. There are large areas showing lamellæ which were at one time parallel with the surface in which comparatively few Haversian systems have been formed. This was probably during the most active period of growth, the later subperiosteal layers being much more completely replaced by Haversian systems.

Figure 8, a field at 4 of Figure 4, shows wonderfully well the outline of the absorption spaces that have been rebuilt and at several places on the surface the marks of removal of bone by the periosteum, and in one or two places slight rebuildings.

In the growth of the jaws, therefore, bone is formed on the surface by the periosteum, the peridental membranes, and the articular cartilage, and is absorbed and rebuilt within, adapting it to all its mechanical influences. We may say, therefore, that the adult bones are the result of all the mechanical conditions to which they have been subjected.

It would be impossible within the limits of this paper to consider in detail all of the forces which exert mechanical influences on the jaws. Probably the first and most important is the force exerted by the growth of organs enclosed in, or surrounded by the bones. This includes the growth of the tongue and the muscles surrounded by the jaws, and the muscles which lie against their surfaces, but more important, the growth of the teeth which are enclosed in the substance of the bone. Not much is known about the nature or the amount of the force generated by the growth or multiplication of cells. More has been done in regard to the growth of plant than animal cells, but our knowledge is very meager. The force is probably very considerable, but acting through very small space. The growing roots of plants move stones, and some experiments have been made to determine the weight that could be lifted by the growth of a rootlet. The phenomena of osmotic pressure are involved in the problem and this involves the question of blood-pressure. There are some analogies between the force exerted by the growth of protoplasm and that generated by the expansion of wood fiber, by the absorption of water, but the whole subject is too deeply complicated for any such superficial an-

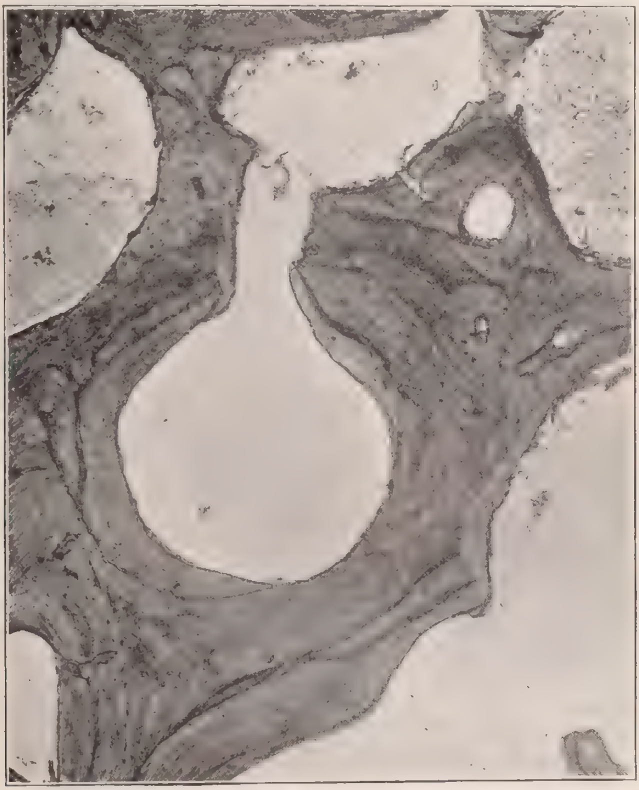

Fig. 5. Cancellous bone from 1 in Figure 4, showing the rebuilding of the spicules and addition of layers at different times.

alysis. Whatever may be the explanation, the growth and the multiplication of cells produces very considerable force; and the growth of the teeth within the substance of the jaw produces mechanical conditions which are very important in the development of the bones of the face.

In a paper recently read before the Illinois State Dental Society I presented a more elaborate analysis of this topic, only the more important phases of which can be given here. While the temporary teeth are erupting they are continually being carried occlusally by the growth of their roots, the alveolar process growing up around them. As the roots of the anterior teeth are completed, they are still pushed forward, upward and outward, by the development of those distal to them. As soon as the temporary dentition is complete, the temporary teeth—alveolar process and all—are forced to move, by the development of the permanent teeth, which lie in crypts below them. In the paper referred to, the relation of these crypts to the roots of the temporary teeth was examined in detail; here it is sufficient to say that the growth of the permanent incisors and cuspids first causes the development between the median line and the region of the mental foramen and later the development of the bicuspids and second and third molars cause the growth which increases the distance from the mental foramen to the ramus. The development of the long roots of these teeth will carry the temporary teeth, alveolar process and all, downward, forward and outward in the upper jaw, upward, forward and outward in the lower. If we examine sections of the alveolar process

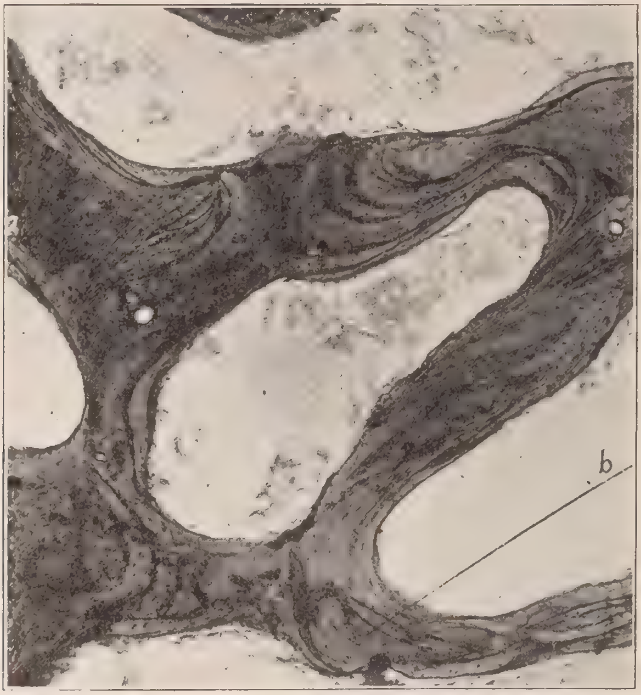

Fig. 6. Cancellous bone from 2 of Figure 4; *a* and *b*, bits of old spicules.

about the temporary teeth we shall see that this growth is accomplished by the formation of subperiosteal bone on the outer and inner surfaces, and subperidental bone at a margin of the process and around the alveolar.

In the production of the alveolar process the peridental membrane and the periosteum work together. As soon as a certain amount of solid layers have been formed, large absorptions occur, which are partly rebuilt by concentric or Haversian system lamellae, which may be again partly rebuilt and destroyed. The important factor is that the teeth are moving in an occlusal direction and the bone is being built and rebuilt under the influence of the mechanical conditions, so that at the later stages of their use the bone of the temporary alveolar process shows an immense number of formations at different periods. The growth of the permanent tooth does not

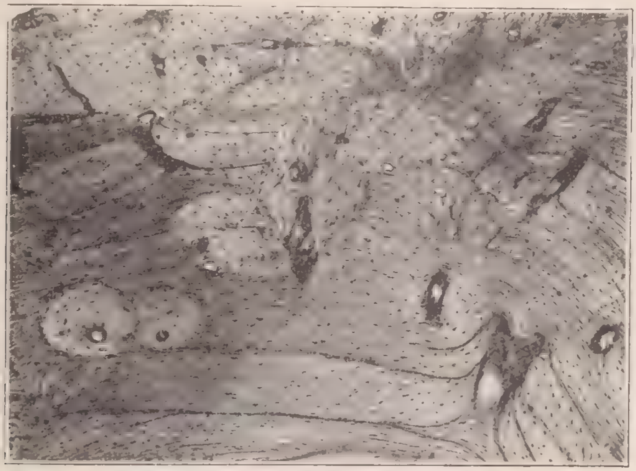

Fig. 7. Compact bone from 3 of Figure 4, showing formation of Haversian systems in old subperiosteal bone.

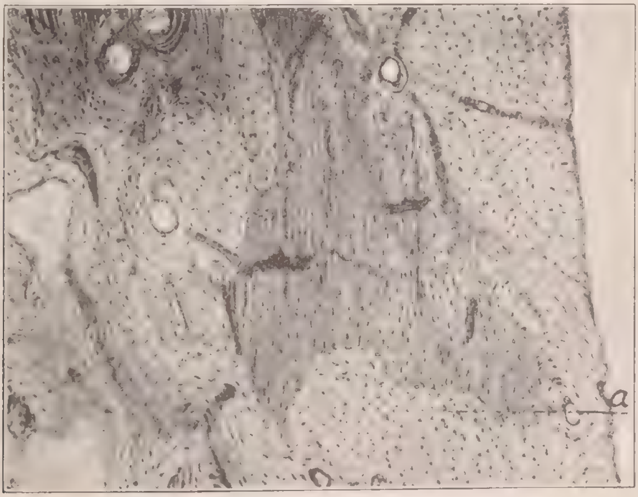

Fig. 8. Compact bone from 4 of Figure 4; a, a rebuilt portion.

cause absorptions simply of the bone forming the immediate wall of its crypt, but osteoclasts appear all through the bone, enlarging the spaces and opening up the structure. Apparently the bone is weakened in this way until what is left can spring under the force and then a new formation is begun to strengthen the tissue.

I have been especially impressed with the way the force exerted by the growth of the teeth in the crypt is responded to all through the substance of the bone covering them, or in fact, throughout the jaw. The result of these tissue changes is that when the temporary teeth are finally pushed off there is only a remnant of the temporary alveolar process left, and to this additions are at once started to attach the erupting permanent tooth. The influence of the growth of unerupted teeth continues to cause growth of bone and movements of the previously erupted teeth until the third molars have taken their places. During all of this period the action of the muscles has been reacting on the bone. First, the muscles of mastication attached to the ramus and the coronoid process rest against the digastrics, geniohyoids and geniohyoglossi attached to the anterior part, the teeth and especially the first molars acting as the fulcrum. It is apparent, therefore, that if the first molars are in abnormal relation the position of the fulcrum is shifted, and the balance of the forces is disturbed, and it is very apparent that if the lower first molars are mesial of their normal relation the result is an over-development of the mandible; if they are distal, there is an underdevelopment. This is the necessary result of the changed distribution of forces in response to which bone is formed.

The effect of the function of swallowing, I believe, has not been appreciated. Every normal person swallows about once every two minutes. In each set of muscular contractions which constitute the act there is a distinct and considerable thrust against the lingual surfaces of the bones and the teeth. Every thrust is a stimulus to the connective tissue cells. The mouth if normally closed is entirely occupied by the tongue, and the base of the tongue is held against the palate and the pillars of the fauces in such a way that a partial vacuum is produced, which assists in the support of the weight of the mandible. This constitutes a mechanical impulse to the growth of bone which is very important in lowering the roof of the mouth and consequently increasing the depth of the nasal cavity from above downward.

The normal action of the lips and cheeks is a most important factor, as we are reminded by the disturbance of growth caused by abnormal function of these muscles. Finally, to sum up the entire matter, I have endeavored to show that both phylogenetically and ontogenetically, bone is produced in response to mechanical stimuli; that in bone formation living cells produce formed material to give strength and that the vital activity of these cells is excited in response to mechanical influences. We have examined some of the many sources of force or energy which affect the vital activity of the cells, and as a result of these considerations we may say that the adult bones are the result of all the forces exerted on them and distributed through their substance by the occlusion of the teeth. If the occlusion is normal the forces are perfectly balanced, and a harmonious and symmetrical development is the result. In proportion as the occlusion deviates from the normal there is a disturbance of the harmony of development. The preservation of normal occlusion is necessary, therefore, not only for the proper mastication of food, but for the proper development of the face and proper function of respiration and swallowing.

ABSTRACT OF DISCUSSION.

Dr. M. H. Fletcher, Cincinnati: I have done some of this class of work, and I have derived an enormous amount of pleasure and profit out of it. Those who have tried to do work of this character know that it entails an enormous amount of labor. A filling which may be too high, or the moving of teeth, or the treatment of the diseases of the sockets, and in fact almost everything we do in the matter of treatment of live tissue, brings these laws into play. I have been especially interested lately in the growth and repair of the cementum, and in several places Dr. Noyes has shown features that are especially instructive to me. I should like to see specimens more in detail as to the growth of cementum—where it begins and where it ends. The tissues lying about the roots of the teeth are subject to disease and repair to a marked degree, and we must understand these laws that we may intelligently treat diseases of the bones and teeth.

Dr. B. E. Lischer, St. Louis: I yield to none in my appreciation of the valuable contribution to dental science which Dr. Noyes has given us. I question one point, however, on which he laid much stress while explaining some of the slides on the screen. I refer to the theory of the elongation of roots and their probable role as a mechanical factor in the dentitional process. It was advocated many years ago by Wedl and since found wanting. Other theories proposed as a plausible explanation of the mechanism of eruption are the pressure theory (pressure of succedaneous teeth), the alveolar theory of Albrecht, the granular theory of Baume, the pulp theory of Wallisch, the functional theory of Robin and the blood-pressure theory of Constant, also as modified by Tomes. The latter is the only accepted one. The objections to the theory of the elongation of roots are as follows: (a) many impacted teeth with fully developed roots never erupt; (b) in the crocodile the developing teeth travel sideways for a considerable distance at right angles to the long axes of the roots; (c) most teeth in the course of eruption travel a greater distance than the entire length of their root or roots; (d) many teeth are erupted before their roots are fully formed.

Dr. Stewart L. McCurdy, Pittsburg: These hypertrophies of bone come from inflammatory conditions, from irritation, or from the projection of bone into the tissues or into the muscles following accident. The presence of syphilis stimulates not only hyperostosis but also endosteitis, and in addition the growth of the entire shaft of the bone, the entire bone becomes involved. Then in another instance diminished growth of the shaft occurs, as in achondroplasia, yet the epiphyses grow just as though the shaft were normal. In other words, the epiphyses are supplied by blood-vessels from entirely different sources than the shaft. Again, there may be hyperostosis of the epiphysis of a long bone, the shaft remaining perfectly normal. This entire subject of growth and development of bone is much clearer in my mind since I have heard Dr. Noyes' paper. The architecture and the reconstruction of the bone bring to my mind most strongly the law of conservation. As nearly as I can repeat that law, it is: Bone is deposited in the various parts of the body as it is needed; then Nature immediately begins to reconstruct that bone, and when it is not needed absorption takes place to diminish the bone to the normal size to perform its function. This is Wolf's law.

Dr. Eugene S. Talbot, Chicago: I think that Dr. Noyes has demonstrated that these forms of absorption are due to irritation. The point which Dr. Lischer makes is rather in Dr. Noyes' favor. All these conditions he mentions act as stimulants to bone development and assist in bone absorption and regeneration. In animals, the animal is either losing the function of bone, or he is developing rudimentary structures, so that cannot be considered here. Dr. Noyes has shown absorption due to irritation. There are, however, two points on which he did not touch, and which Dr. McCurdy mentioned in regard to the bone development and absorption, and that is the nervous system. In the case of arrest of development we have arrest in ontogeny, due either to some condition *in utro* or to disease, such as scarlet fever, pneumonia, or any other constitutional disease early in life. On the other hand, large jaws, those measuring 2½ inches in diameter, are due to want of resistance in phylogeny; in other words, arrest of development in phylogeny from the lower animals, such as the anthropoid apes, etc. In that case the large developed bones take the line of least resistance toward the lower vertebrates.

Dr. M. H. Fletcher, Cincinnati: I did not discuss the idea of pressure in the eruption of teeth or any other force, because I leave that just as I leave the differentiation of cell life in any other part of the body. If anyone can tell why a blade of grass grows, or why union of the male and female cell finally produces the epiblast, the mesoblast and the hypoblast, or why the presence of the dentin against the periosteum of the dental follicle induces a layer of cells which produces cementum then I think we are near to answering these questions. The practical feature I get from this is that under certain conditions Nature will reproduce certain tissue, and that in order to reproduce the new she must first carry away the old. Now it seems more important for us to know in what condition to put tissues in order to have repair, when there is broken down tissue from disease, and the presentation of Dr. Noyes is a beautiful display of these laws.

Dr. Frederick Noyes, Chicago: I did not emphasize the elongations of the roots alone, and I did not emphasize the succedaneous teeth alone, or any one thing alone, but what I did try to state was that connective tissues are tissues of environment ,and that they respond to mechanical stimuli, and that the elongation of the root necessarily produces a mechanical stimulus. It cannot help it. Consider for a moment the form of the root, the relation to the surrounding tissues and the fact that there is multiplication of cells in that space which produces force. So long as the root continues to grow it must exert a mechanical influence. The objections cited were that action and reaction are equally opposed in direction and if the resistance above the tooth is greater than the resistance at the apex, the apex will move and not the crown. I emphasized the fact that in the development of the tooth the floor of the crypt was pushed through the cancellous bone and did not react on the plate above until it reached the cortical plate at the lower border of the jaw, and the resistance was greater below than above and then the other end had to move.

Dr. McCurdy brought out several things which I could not go into, and, in particular, the idea that with mechanical stimulus without nourishment, growth is impossible. There may be mechanical stimulus, but if the blood-supply be cut off there cannot be growth. I did not mention this because it is an inhibiting factor, not a developing factor. It is an important factor in the discussion, however.

Dr. Talbot referred to the influence of the nervous system, and that is a field which has important bearings in this connection. The point cited by Dr. McCurdy, that we would have changes throughout the substance of the bone beyond the region of the inflammation, indicates a nerve connection between the two, which, when a growth is set up in this position in response to mechanical stimulus, continues its action in a field beyond. In the same way, an irritation of one tooth may cause development of dentin within the pulp chambers of all the teeth within the same nerve-supply.

The most important thing which I wanted to bring out was that from a phylogenetic standpoint, from the beginning of evolution apparently connective tissues respond to mechanical conditions. Dr. Brooks stated as the greatest characteristic of life, the ability of adaptation to environment, and the characteristic of the connective tissue cell is to adapt itself to mechanical conditions. Following that idea through, we find that it is the mechanical influence to which the vital activity of the connective tissue cell responds with the changes in the structure of the tissue both in reconstruction and in production.

THE DENTIST AND HIS INCOME.*

By L. S. La Pierre, D. D. S., South Bend, Ind.

THIS paper is being started on the assumption that the dentist actually has an income from his profession. I hope you are all guilty. From your prosperous appearance I judge you are. In discussing this subject I will first take up the question of the dentist himself.

The first requirement of a successful dentist is that he be a clean man, both morally and physically. Unless we are clean morally we cannot be true to ourselves and our profession. Many an able practitioner has utterly failed because of this fault. I can think of no other calling where one should guard more cautiously his conduct in this respect. We surely will not be patronized by a trusting community if these same people do not first of all know that they are to be treated in a thoroughly gentlemanly manner, by men who are gentlemen in every sense of the word. Therefore, I say most emphatically, look to your morals and conduct along these lines. What right a man has to expect patronage from the public when his whole life is such that he could not give them careful treatment is more than one can understand. Along the line of personal cleanliness, I often recall a lecture given by Dr. A. W. Harlan to our class in materia medica, when endeavoring to impress the students as to cleanliness and personal habits closing his remarks with the advice, "manage your office economically, but do not save expenses in personal or office linen." This advice was so deeply impressed on my mind that I have never forgotten it. To supply one's self with plenty of office linen and always have it clean is not expensive. As to our personal linen, a clean 75c shirt, with collar and cuffs in same condition, certainly makes a better appearance than more expensive garments badly in need of attention. Frequently in visiting a brother's office, we find the whole establishment in a confused condition, instruments scattered about, possibly plaster tracked from laboratory to operating room, even to the reception room; carelessness is the only excuse. This surely fails to favorably impress possible patients. Leaving an office of this kind we are determined to bring this lesson home. On the other hand, to call on your cleanly brother practitioner is a pleasure; his personal appearance as he greets you is gratifying and the general aspect of his office is to be admired. The contrast I am endeavoring to picture is undoubtedly stronger in the eyes of our patients than in our own. Guarding against such carelessness should be our aim. To give our office an air of cleanliness and prosperity it is not necessary to have it elaborately equipped. To a clean man and office, add ability and industry, and his income is assured. At this time, when so much is being said concerning the business side of dentistry, I hardly hope to add new ideas, but it occurs to me too many of us are prone to travel in the old rut, and not have our business ideas conform to new conditions. Conditions, as we all know, have changed. Conducting a practice is much more expensive than, say ten years ago. This probably is true more in the larger cities than in smaller communities, but for all it is greater all along the line. We are conducting our practice differently than in the past. How few stop to think the common custom of dentists as a class was to yield without question to the demand of patients to *pull* it *out* when they came to us with an aching molar, when now it is by long odds the exception. What is the result? Your fee, whatever it was, most invariably was in your pocket when the patient left the office, easy and quick money, as many of the older men here can vouch for. To-day, to save these offending members is our constant aim with too often small remuneration. The ratio of fees charged for these old time extractions and present day saving of teeth is not consistent with services rendered our patients. In my opinion this explains, in no small manner, the present discontent as to our income. If we received fees for treating putrescent pulps or pulps needing devitalization that would equal fees charged for other operations requiring the same length of time, I firmly believe we would increase our incomes from 20 to 30 per cent. Think of it! Putting in foundations upon which to construct permanent work, from which we and our patients expect lasting results, and receiving the smallest portions of our fees. In the evening after possibly a hard afternoon's work, consumed largely with tedious treatment, have many of you looked to your charge account and felt repaid for the good you had done? Right here we need education. Should the discussion of this paper bring out points that would show us how to remedy this, I shall feel that it has not been in vain. The man who conceived the idea of extracting a mouthful of teeth for the privilege of replacing them with a $10.00 plate, was undoubtedly the sire of the younger man who treats pulps and fills root canals for the fun of putting over them $1.50 amalgam fillings and $5.00 crowns, and I am sorry to have met either of them. In my opinion it is foolish to attempt to establish any uniform set of fees. As to ability, men differ in dentistry as well as other pursuits of life. With a given condition and same material at hand one man will be able to obtain results both beautiful and lasting, while another will succeed only partially, and still another will utterly fail, under such condition. Fees cannot be uniform, nor should they be. The fee question is up to the man. Be sure of yourself, work hard and conscientiously for results. Do not be afraid to ask for a fee that is in keeping with the good you have done and which will assure you something for the rainy days to come. If we endeavor, to the best of our ability, to practice our profession as taught in our colleges, in the many splendid clinics that men so unselfishly give their time to, in ably edited dental journals, we are entitled to incomes ample for our needs. I believe the people are willing to pay, but do want results, to which they are entitled. To allow your expense account to exceed 30% or 35% of your gross income, in my opinion, is not good business. Should it do so, lessen your expenses or work harder to increase your income, probably attention to both would not be amiss. The continued harping, that the dentist is not a good business man, is something with which I have no patience. I believe we have fewer actual failures, in a financial way, than one will find in the so-called commercial pursuits. In the first place a large percentage who study our profession make their own way; they have no financial backing to speak of; they start by giving at least three years of their lives, that might be revenue producing, to study, besides meeting their college and living expenses. After this they are forced to meet the expenses of fitting an office and living while practice building. A major portion of us are many dollars worse off than nothing when the ship is finally launched, but by continual application, strict attention to business, and endeavoring to make each patient a satisfied one, and thereby a "booster," of you will, we gradually pay our indebtedness besides meeting current bills, finally have a bank account, look our neighbors in the eye, and say "I am a dentist." As to the attention colleges are now giving to teachign students to conduct practice from a business standpoint, I a mnot informed, but remember, rather sadly, *nothing* was said along these lines in 1890-91-92. We were taught to meet conditions that would require our attention as dentists, but nothing was said about how to get the money, and we needed it. I hope more attention is being paid to the teaching of young men, as to what they should demand for their services. I wish to conclude this paper with a quotation from Dr. T. L. Gilmer, of Chicago. He says:

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*Read before the Northern Indiana Dental Society 1910

> "Little instruction is given in economics to the student in dentistry while preparing for his life work. A very few schools do attempt training in this useful branch, but the number is so few that it is almost a negligible quantity. A student should not be turned out to commence his life work without giving him knowledge of practice building and some instruction as to a scientific method of making charges for his services. Few dentists ever fully learn the latter. To be highly qualified to practice one's profession, and at the same time have a financial sense, does not, in my opinion, necessarily constitute a dual existence. The two combined give the superior man. They are a combination forming, when properly adjusted, a perfect whole. Continuous growth, mentally, demands remuneration to give opportunity for better facilities for this growth."

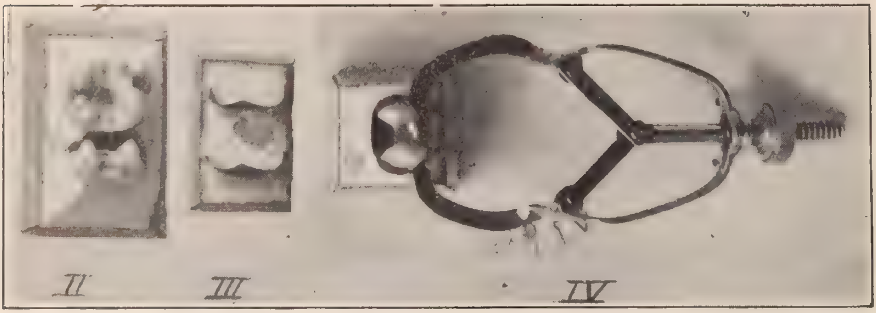
AMERICAN CIRCULATING DENTAL CLINIC

AN AUXILIARY MATRIX.

Alfred P. Lee, D. D. S., Philadelphia, Pa.

A simple method of overcoming the difficulty often experienced in adapting a matrix to an approximal occlusal cavity when the cervical portion of the missing wall presents a concave surface due to the bifurcation of the roots.

By use of a sheet of copper 5-1000 of an inch thick, in conjunction with a mechanical matrix and holder, or an additional strip of copper or steel, ligated in position, an appliance may be quickly made, which, when removed after the filling has been inserted, will be found to have kept the filling the desired shape, leaving no overhanging portions at the cervex to trim away.



A piece of copper plate, thoroughly annealed, and large enough to extend, say, $\frac{1}{8}$ in. beyond buccal and lingual margins, is pressed with cotton or bibulous paper pellets to conform to the concave root periphery at the cervex. (See Fig. 2.)

The copper is then carefully removed, the concave portion of the plate is touched with zinc chlorid, and over an alcohol flame soft solder is flowed into the depression, any excess solder being removed with a disk. (Fig. 3.)

The prepared copper plate is then placed in position; all around it the mechanical or other matrix is adjusted, and when fully tightened the free edge of copper is burnished against the steel. (Fig. 4.)

If the cavity is to be filled with amalgam, hard wax, instead of solder, may be used for filling up the concave surface on the copper. In either case a slight excess of contouring material is of advantage, in that the copper plate is made to hug the tooth more tightly.

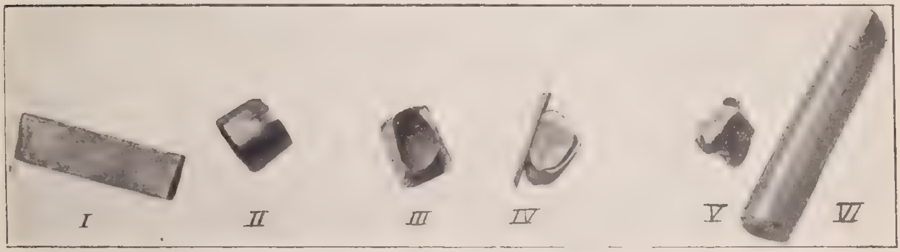
TELESCOPIC CROWN FOR BRIDGE WORK.

E. L. Kanaga, D. D. S., Philadelphia, Pa.

No. 1.—A piece of metal for the band is cut from 30-gauge coin gold, the occlusal end being 1-32 of an inch smaller than the gingival.

No. 2.—Showing the band joined sweated.

No. 3.—The floor sweated to the band.



No. 4.—The core is formed by holding the inner cap in a paper form and pouring fusible metal into it.

No. 5.—The outer cap is made by driving the inner cap, now mounted on the core, into it.

No. 6.—Shows method of obtaining contour.

CAST GOLD CROWN.

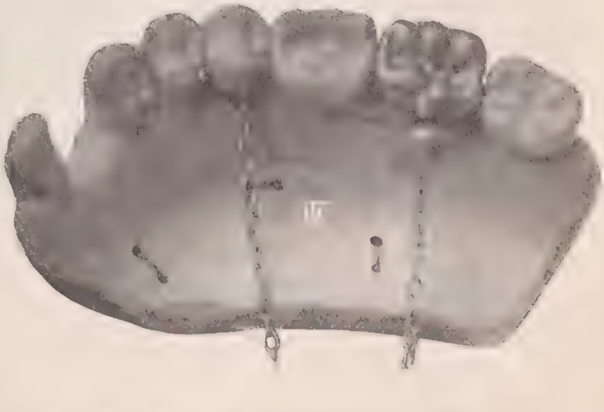
C. E. Meerhoff, D. D. S., Chicago, Ill.

Especially adapted for bridge abutments. Trim root, fit band of 35 or 36 gauge platinum (or gold), stove pipe shape. Nip end of bands and bend over root. (Fig I.)

I

II

III



Have patient bite into wax, giving exact articulation. (Fig. II.)

Carve to correct shape and with bur or suction remove wax from inside as desired.

Pass quickly through alcohol or Bunsen flame, or rub down wax with chloroform to finish or smooth wax. (Fig. III.)

The crown on model has not been touched by buffer or wheel.

ADVANTAGES

Strength—Thickness of metal external to band makes crown unbreakable.

Definite seat—Ease of adaptation of thin metal obviating irritation at gingival.

THE IGORROTES' METHOD OF CASTING, USING DISAPPEARING MODEL.

Exhibit of Dr. Weston A. Price, Cleveland, Ohio.

Their casting and melting furnace is a forge, the fire pot is made of crude stones, and bamboo tubes are used for the bellows and connecting pipes. Feathers are stuck in the piston sticks similar to those in a bird's wing, allowing the air to pass through them on the up stroke and holding it on the down stroke. Homemade charcoal is the fuel, and they can melt brass in fifteen minutes. These specimens were purchased from the natives

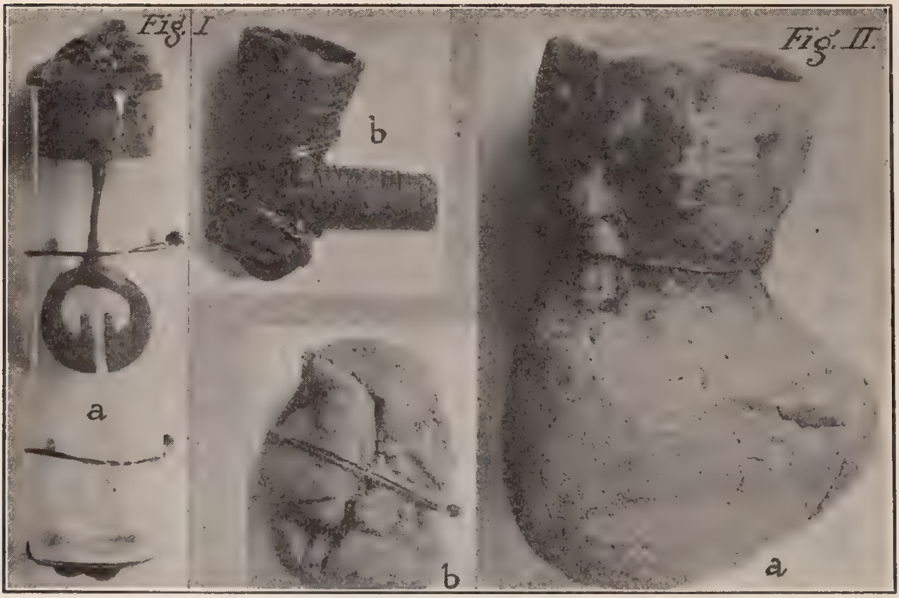


Fig 1.—Pipe and earring made of beeswax by the Igorrotes of the Philippine Islands for disappearing models for casting in brass, also a sample of the wax.

Fig. 2.—The pipe invested in a wet clay with crucible funnel for holding the brass for a head of metal when melting it for casting, also a sample of clay. See photo of casting.

who were using them at the Seattle Exposition in 1909. They also exhibited the same process at St. Louis Exposition. Native traditions indicate that these Igorrotes have used this method for a thousand years.

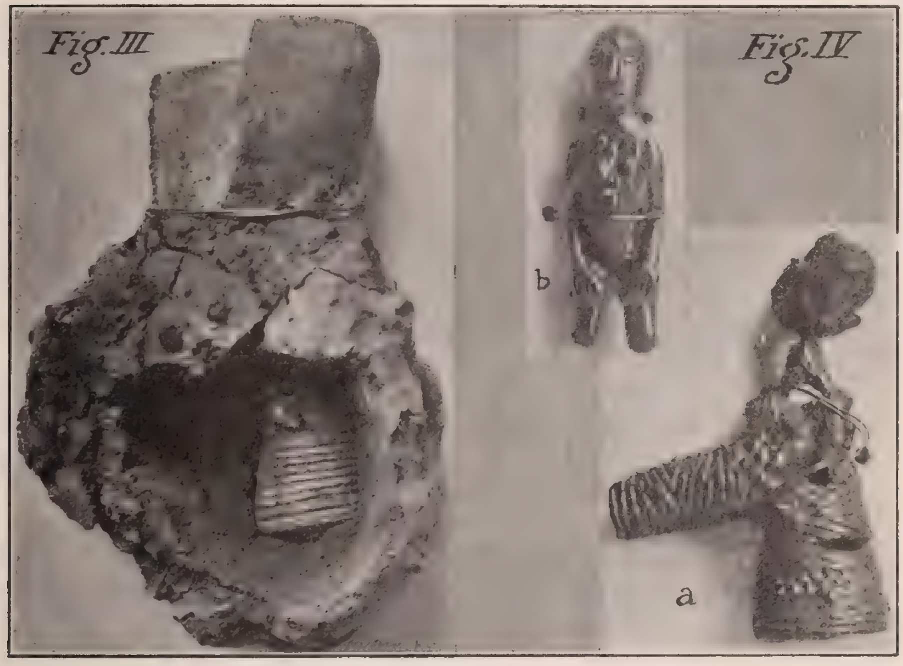


Fig. 3.—The investment cup open to show the method of coreing for the hole in the stem.

Fig. 4, *a*—A pipe after casting (this one a cull).
b—An image cast by them from a carved beeswax model.

A RICHMOND CROWN BY A NEW METHOD.

Dr. H. M. M'Farland, Kansas City, Kansas.

Having decided that the crown is to be used, select the shade. Secure the size of the facing by using a Hollingsworth copper strip. Bend one end for the length and the other for the width. Apply the ends to a rule and order the size desired. This is a quick method for securing the size of any teeth that you wish to order. It saves taking an impression and making a model and is easily telephoned or written in with your order. Any facing that you wish may be used, but I prefer Steele's facing on the anterior teeth.

The root should be prepared by leaving it plenty long on the lingual side, and just a little shorter than the gum line on the labial side, removing the frail edges of enamel.

After having prepared the root carefully, enlarge the canal and adjust the pin. It is essential to have a strong pin, which should be made either by reinforcing platinum with solder or by shaping pure gold to the canal and flowing it full of solder. After constructing the pin, use the knife-edge carborundum stone to make grooves on the mesial and distal surfaces to permit better adhesion of the cement.

Trim a small piece of paper so that after covering the end of the root it is large enough to bend over the edge and comes up just under the free margin of the gum. Using this paper as a pattern, lay it on a piece of pure gold (thirty-six gauge) and cut out a piece the exact size.

The gold is placed on the face of the root, the pin pressed through it into the canal, and by the use of two large round amalgam instruments the gold is burnished to the face of the root.

After burnishing it should be removed and a distinct line or mark is noticed in the gold, showing the circumference of the root. Slits should be cut at intervals in the band portion, allowing them to extend up to this line.

The pliers should now be used to bend the band so that it will fit around the end of the root.

Replace and adapt the gold to the root, pressing the band part well to place with a small chisel or suitable instrument.

Having secured the best possible adaptation, hold pin and gold firmly to place and unite with sticky wax. Remove and fill the band with investment, also place a little on a slab and set pin into it, making a shoulder of investment all around the band, but allowing none to cover it. Cover the entire surface of gold and pin exposed with flux. Cut small pieces of twenty-karat solder the width of the band and stand them on the shoulder of the investment, leaning them against the band, and place pieces of the same solder on the end portion.

With a pair of pliers hold the investment slanting with the lingual side of the band down and by the use of the mouth blow-pipe melt the solder, covering and reinforcing entire surface of gold, joining it to the pin.

Replace the band and pin on the tooth and grind the Steele facing and backing so that there is a good joint between the two, when the facing is the correct length and in its correct position.

After grinding, care should be taken to see that the facing can easily be removed from the backing. By the use of sticky wax join the backing and base as you expect them to be when finished. Retain the parts in their correct position and remove them from the tooth; slip the facing from the backing; put whiting on parts occupied by the facing, and invest.

Use either eighteen or twenty-karat solder to cover lingual surface, joining and reinforcing entire lingual portion.

After polishing the crown, the facing is cemented to place and it is complete.

We have had patients with a very close bite and also cases of which many or all of the posterior teeth had been lost. Here is where we must have a very strong crown, or it will fail. If the crown is a plain post and plate it may spring and leave a V-shaped opening on the lingual side, causing a failure.

If the crown is a Logan, it may break or the root may split, but if you have reinforced the pin or have made the gold and solder pin and have a good fitting band that has been reinforced with solder, you will have a crown that will remain satisfactory.

It is a well known fact that the roots of teeth do not slant at the same angle. If post and plate crowns are used for anchorage in bridge work. it is very difficult to get the crowns to fit to the ends of the roots at the same time, and they must fit or we have a bad piece of work.

If the improved Richmond crown is used the bridge is more easily adapted, the joint is covered, and the bands can be made to fit accurately.

If Steele's facing is used, there are no pins to cover, thereby giving more space for the occlusion on the lingual surface. It permits a closer union between facing and band, is quicker to make, and the facing is more easily replaced if broken.

I have no doubt that the most objectionable criticism to the banded crown is the irritation of the tissues. This, I think, was due to the manner of construction and extreme methods of fitting, of which I have spoken.

In constructing the improved Richmond crown by the method which has been described, the size of the band is controlled perfectly from a hair's breadth to any width desired. It is a quicker method and the band can easily be made to fit close to the root. It is so constructed that the facing covers the very narrow portion on the labial side, allowing no gold to show. This is a great improvement, as the diaphragm and backing used in the old method left an unsightly gold rim showing on the labial side.

It takes just a little more time, but care must be taken to see that the band extends just under the free margin of the gum and no farther. I would rather have the band come just to the gum than to extend under too far.

OCTOBER

The days of gold have come upon the hills,
And dreamy sunshine all the brown earth fills
With plumes of scarlet nodding 'mong the pines,
And trees of crimson burning 'long the lines
Of woods, whose fields so green and quiet run
And catch the mellow light of hazy sun,
And speak of clover mown and labor done.

And now, with autumn's moonlit eves,
  Its harvest time has come:
We pluck away the frosted leaves,
  And bear the treasures home.

—From Whittier's "Corn Song."

EDITORIAL

AN ENGLISH PHYSICIAN'S DENUNCIATION OF AMERICAN DENTISTRY.*

AN ARTICLE under the above caption appears in *Current Literature* for August. The opening paragraph is as follows:

> "The world has been wofully misled for many years regarding American dentistry, in the opinion of the illustrious pathologist to the London Charing Cross Hospital, Dr. William Hunter. It is his matured conviction that dentistry as practiced in this country is a curse to the world, the fruitful source of one of the most terrible scourges afflicting the physical frame of man—sepsis. In other words, dentistry, as practiced by even the ablest men in the American profession, is spreading deadly maladies not only among the moderately well off, but among the very rich. Indeed, the rich are the worst sufferers because they can afford the high price of the most skilled work."

This article was prompted by a paper prepared by Dr. Hunter and published in the *London Lancet*, a leading British medical journal. In that paper Dr. Hunter, among other things, says:

> "No one has probably had more reason than I have had to admire the sheer ingenuity and mechanical skill constantly displayed by the dental surgeon. And no one has had more reason to appreciate the ghastly tragedies of oral sepsis which his misplaced ingenuity so often carries in its train. Gold fillings, gold caps, gold bridges, gold crowns, fixed dentures, built in, on, and around diseased teeth, form a veritable mausoleum of gold over a mass of sepsis to which there is no parallel in the whole realm of medicine or surgery. The whole constitutes a perfect gold trap of sepsis of which the patient is proud and which no persuasion will induce him to part with. For has it not cost him much money, and has he not been proud to have his black roots elegantly covered with beaten gold, although no ingenuity in the world can incorporate the gold edge of the cap or crown with the underlying surfaces of the root beneath the edges of the gums? There is no rank of society free from the fatal effects on health of this surgical malpractice.
>
> "I speak from experience. The worst cases of anemia, gastritis, colitis of all kinds and degrees, of obscure fever of unknown origin, or purpura, or nervous disturbances of all kinds ranging from mental depression up to actual lesions of the cord, of chronic rheumatic affections, of kidney disease, are those which owe their origin to, or are gravely complicated by, the oral sepsis produced in private patients by these gold traps of sepsis. Time and again I have traced the very first onset of the whole trouble of which they complained to a period within a month or two of their insertion. The sepsis hereby produced is particularly severe and hurtful in its effects. For it is dammed up in the bone and in the periosteum, and cannot be got rid of by any antiseptic measures which the patient or the doctor can carry out. Morever, it is painless, and its septic effects therefore go on steadily accumulating in intensity without drawing attention to their seat of origin.

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*Since writing this editorial we have received an article on the same subject from Dr. C. M. Wright, which appears in this issue and to which we invite the reader's attention. Editor

> "Such are the fruits of this baneful so-called 'conservative dentistry.'
>
> "The medical ill-effects of this septic surgery are to be seen every day in those who are the victims of this gilded dentistry—in their dirty-gray, sallow, pale, wax-like complexions, and in the chronic dyspepsias, intestinal disorders, ill-health, anemias, and nervous ('neurotic') complaints from which they suffer. In no class of patients and in no country are these, in my observation, more common than among Americans and in America, the original home of this class of work."

The article in *Current Literature* continues thus:

> "After ten years' experience of the nature of these dental effects and of the difficulty in removing them from the mouth of the unfortunate wealthy people best able to afford them, Doctor Hunter feels that the only solution of the difficulty is a spread among dentists of a knowledge of sepsis. The problem is a pressing one for the dental profession, its solution being of importance in the interests of public health. The civilized world beholds one branch of the healing profession struggling with might and main to prevent a poisonous condition of the human system, known as sepsis. There is in the world another great department of the therapeutic world, that of dentistry, industriously engaged in promoting the evil of sepsis. Dentistry, that is to say, ignores the fundamental truths of anatomy, physiology, pathology and the tissues generally. 'To gold-cap a healthy or diseased tooth in order to beautify or preserve it is the negation of every one of these truths [of physiology]—a veritable apotheosis of septic surgery and of surgical and medical malpractice.' It is a horror of the age.
>
> "Doctor Hunter speaks from experience. He has had many such cases and he describes them in the London *Lancet* as 'the most trying and pitiable cases with which one has to deal,' for they are produced by dentists. The worst cases of septic gastritis, enteritis and colitis, of ill health, anemia, obscure septic fever and other manifestations of medical sepsis, are in Doctor Hunter's experience—so he avers—those in which the greatest amount of 'American skill,' in the shape of gold work, has been bestowed upon the mouth.
>
> "There seems only too good reason to infer, moreover, that the professional education of dentists is often of the most superficial sort. The profession is recruited in some American communities almost at haphazard. The training is frequently of the manual kind. Provided the student displays a digital dexterity in manipulation, he is not questioned too closely sometimes regarding his scientific knowledge. He goes about his work in the densest ignorance of such things as therapeutics and infection. He is no scholar and in no sense a man of science."

Here is an article that is a great injustice to dentists and dentistry, for it is misleading. While we may see occasionally an irritation of the gum from an ill-fitted gold crown, it is the exception and not the rule. Properly constructed crowns and bridges are not the cause of chronic inflammation of the gums and septic conditions of the tooth sockets. Where there is one case where such conditions are caused from ill-fitting crowns or abutments, there are hundreds of cases where no irritation exists from the metal attachments, and a wholesale condemnation of crowns and bridges is an injustice to dentists and dentistry.

If Dr. Hunter had been thorough in his diagnosis, even in many of the cases that have come under his observation, he would probably have found that the septic conditions were due more to irritation from salivary and serumal deposits on the roots of teeth above the metal attachments than from the adaptation of the crowns. Every dentist has seen such pyorrheal conditions of the gums and sockets now and then in mouths where there is bridge-work, and many are the cases of the same conditions in mouths where there is no bridge-work.

Unsanitary conditions of the mouth, gums and sockets arising from a disregard for oral hygiene are many, and it is to correct this that dentists have waged such a campaign for education of the public regarding the beneficial results of the systematic application of oral hygienic measures for the care of the teeth and mouth. It is true that we find dentists in the dental profession who are not doing the skilled work that is expected of them, the same as we find unskilled surgeons in the medical profession, but the work of such men should not be taken as a type of the best work accomplished, nor be heralded to the world as the best that men of these professions can give. If Dr. Hunter and the writer of the article in *Current Literature* could see the thousands upon thousands of cases of bridge-work in mouths that show no diseased condition of the gums or other tissues they would be less ready to condemn *in toto* all dental work and dentistry.

Dentists have done, are doing, and will continue to do dental operations that are of lasting benefit to mankind notwithstanding the misleading article to which we have referred.

Regarding the closing paragraph in the article quoted from *Current Literature,* it is too absurd to notice. If the writer had been as anxious to seek the truth by investigating the dental college requirements as he was to create a sensation among his readers by misleading statements, he would have come nearer to fulfilling what is expected in a first-class magazine.

MORE GOOD THINGS TO FOLLOW

Several excellent articles that we hoped to publish in this issue have, of necessity, been carried over to the November number. Our contract with the printers gives us a certain number of pages each month for text and advertisements, and when we have set more than enough to fill the allotted pages some must be held over until the next month's issue.

We hope our readers and contributors will be patient, for while we want to give our readers all the good things obtainable, we cannot give everything at once.

OHIO STATE DENTAL SOCIETY

We want to say just a word at this time regarding the coming meeting of the Ohio State Dental Society, to be held in Columbus, Dec. 5-6-7, 1911. An exceptionally attractive program is in preparation and will be published in the November issue of THE SUMMARY. Better accommodations have been secured for the meeting and the indications are that it will be one of the best ever held, and it is a good idea to cross off the dates in your appointment book now.

CORRESPONDENCE

"AN ENGLISH PHYSICIAN'S DENUNCIATION OF AMERICAN DENTISTRY."

By C. M. Wright, B. S., A. M., D. D. S., Cincinnati, Ohio.

THIS is the title of a paper in the "Science and Discovery" department of the August, 1911, number of *Current Literature*, a well-known 25-cent monthly magazine of New York, which purposes to be a review of the times.

The paper begins with the startling announcement that "the world has been woefully misled for many years regarding American dentistry." This is given as the opinion of the illustrious pathologist of the Charing Cross Hospital of London, Dr. William Hunter. It is his matured conviction that dentistry is a curse to the world, the fruitful source of one of the most terrible scourges afflicting the physical frame of man—*sepsis.*

> "In other words, dentistry, as practiced by even the ablest men in the American profession, is spreading deadly maladies not only among the moderately well off but among the very rich. Indeed, the rich are the worst sufferers, because they can afford the high price of the most skilled work."

This is quoted from the writer of the magazine paper and gives an idea of the impression Dr. Hunter's article in the *London Lancet* made upon him. He goes on:

> "After ten years' experience of the nature of these dental effects and of the difficulty in removing them from the mouth of the unfortunate wealthy people best able to afford them, Dr. Hunter feels that the only solution of the difficulty is a spread among dentists of a knowledge of sepsis. This problem is a pressing one for the dental profession, its solution being one of importance in the interests of public health."

And again, notice carefully:

> "The civilized world beholds one branch of the healing profession struggling with might and main to prevent a poisonous condition of the human system known as sepsis. There is in the world another great department of the therapeutic world, that of dentistry, *industriously engaged in promoting the evils of sepsis.* Dentistry, that is to say, ignores the fundamental truths of anatomy, physiology, pathology and the tissues generally. 'To gold cap a healthy or diseased tooth in order to beautify or preserve it is the negation of every one of these truths [of physiology]—a veritable apotheosis of septic surgery and surgical and medical malpractice.' It is a horror of the age."

Now let us read a few words, quoted by this magazine writer, from Dr. Hunter himself:

> "No one has probably more reason than I have had to admire the sheer ingenuity and mechanical skill constantly displayed by the dental surgeon. And no one has had more reason to appreciate the ghastly tragedies of oral sepsis which his misplaced ingenuity so often carries in its train. Gold fillings, gold caps, gold bridges, gold crowns,

fixed dentures built in, on and around diseased teeth form a veritable mausoleum of gold over a mass of sepsis, to which there is no parallel in the whole realm of medicine or surgery. The whole constitutes a perfect gold trap of sepsis of which the patient is proud and which no persuasion will induce him to part with. For has it not cost him much money and has he not been proud to have his black roots elegantly covered with beaten gold? There is no rank of society free from the fatal effects on health of this surgical malpractice. I speak from experience. The worst cases of anemia. gastritis, colitis of all kinds and degrees, of obscure fever of unknown origin, or purura, or nervous disturbances of all kinds ranging from mental depression up to actual lesions of the cord, of chronic rheumatic afflictions, of kidney disease, are those which owe their origin to, or are gravely complicated by, the oral sepsis produced in private patients by these gold traps of sepsis.''

Then the doctor, after this striking illustration of medical logic—this exact exposition of the science and art of etiological diagnosis—sneers a little at so-called ''conservative dentistry'' and renames it ''septic dentistry.''

Dr. Hunter published through Cassell & Co., in 1901, a small volume of thirty pages on ''Oral Sepsis as a Cause of Septic Gastritis, Toxic Neuritis, and other Septic Conditions, with Illustrative Cases.'' The American dentist considered this little volume a valuable addition to his own knowledge of the remote effects of septic conditions of the oral cavity, and felt grateful to Dr. Hunter for his contribution to a subject which has occupied so much of the dentist's attention in his daily and hourly practice—oral sepsis. Oral sepsis, the *bete noir* of the educated dentist, which he has fought with all the means at his disposal from times preceding these and before the definite cocci, whether of the staphylo or strepto variety, or the bacilli had been dreamed of as factors in the genesis of disease. He knew about irritation, inflammation, pus, putrid matter and diseases and he, with other surgeons, did his best to keep the tissues free from them, and never intentionally ''entrapped them with gold.'' Now he is to learn that gold in the teeth, or about the teeth, is *the* cause of appendicitis or any other itis in the anatomy, from the spinal cord to the kidney. He is to learn this from a medical man, a pathologist. He is also to learn that there is an underlying animus against *American* dentistry.

Dentistry is a science and an art, as is surgery, and it rests securely and is built upon Biology, through the branches of Physiology, Anatomy and Chemistry. Dentistry has done fine work in special Histology, Embryology, Physiology and Surgery. I cannot see a difference in the primary professional education of the surgeons, the oculists, the orthopedists and the dentists excepting that the latter has special schools, where in conjunction with his medical studies, he is given opportunities to acquire mechanical skill of a high and varied character. That he is only a skilled mechanic with no knowledge of general physiology or of fundamental medical subjects is a fixed idea in the minds of ignorant physicians. This idea was fixed years ago, and it was on account of its rigidity that the efforts on the part of Chapin A. Harris and other prominent and ambitious

American dentists, three-quarters of a century ago, failed to effect arrangements with medical colleges for the establishment of dental departments in recognized medical schools. This was the reason for the inauguration of the Baltimore Dental College in 1840, for the Ohio College of Dental Surgery in 1845, and for the establishment of the hundreds of special dental schools and colleges throughout the civilized world on the American plan. Dentistry grew up as an independent profession — as a separate tree but in the same field and from the same soil in which the medical school is planted. It is not a weed but a flourishing, useful tree, with its roots deeply set in the Science of Biology, absorbing nourishment from all the elements of this soil — with a fair and sturdy trunk, bearing branches which can be named Morphology (anatomy and histology) and Physiology (function) with the accompanying branch of Pathology or morbid function and morphology of tissues and organs made up of living cells. When the first dental college was opened the cell doctrine of Schleiden and Schwann in morphology was very young, just opening the way, as it were, for Virchow's *omne cellula e cellula.* The microscope was not a familiar instrument and histology was not a branch taught in medical schools. It was nearly forty years later that medical and dental schools began to accept with caution the parasitic theory of the origin of disease, but the dentist kept abreast in the forward movement, and Miller demonstrated the Etiology of Dental Caries as a specific infection from a specific lactic acid producing bacillus in such a clear way that in the dentin tubes under the microscope, the natural and the artificially produced disease cannot be distinguished. This has nothing to do directly with Dr. William Hunter's denunciation of American dentistry, but it may show that Dr. Hunter is attacking wholesale a profession as well posted in surgery and the principles of general pathology as he and his hospital confreres believe themselves to be.

My personal observation of half a century has furnished the premises for a logical conclusion that physicians as a class are no better grounded in the principles of medicine than are dentists, and that as for special histology of dental and oral tissues, and special etiology of dental and oral diseases, the physician had much better remain quiet in a discussion when a dentist is present. The pompous assurance of wisdom in the statements of so many of my dear medical friends in regard to dental matters would be amusing indeed if it were not pitiable. In Dr. Hunter's little volume on the subject of Oral Sepsis the dental readers have reason to believe that general surgeons, physicians and dental practitioners should all be warned against the neglect of this condition of oral sepsis. In the volume dentists are not accused of being the prime factors, with their skillful manipulations of hammered gold, in causing oral sepsis. On page 27, on Treatment, may be found the following:

> "A surgeon may be said to spend his life combatting septic infection; he surrounds himself at his work with everything scrupulously clean; he goes to any expense and initiates arrangement of the most perfect order in his operating theaters. He will

> not even touch the skin without scrubbing or doing his best to get rid of all possible infection. But while doing all this he will, without the slightest regard, operate when the mouth of his patient is in a septic condition.
>
> "With regard to the treatment of these cases, what I think wants fuller recognition on the part of all—physicians, surgeons, dental surgeons and patients—is the septic nature of this condition of caries of the mouth.
>
> "The chief problem with regard to these conditions is to find out where the pus organisms have gained entrance. These organisms are not ubiquitous but are definite organisms causing pus formations."

We of today all agree with this statement of Dr. Hunter's, made ten years ago. Can we agree with him in his 1911 diagnosis, that dentists themselves cause, by their gold fillings, gold caps, etc., etc., the infections, pus formations, etc., which we in common with all surgeons abhor and do everything possible to prevent? With full knowledge of the horrors of sepsis, do we daily wilfully perform "septic surgery" for our innocent patients for money? The charge is an infamous one and Dr. Hunter, "illustrious" as he may be and valuable as his services may be on "oral sepsis," should be held up to the dental profession as a man incapable of scientific reasoning. He cares not a rap for his premises and his conclusions are the result of animus. I called this method of reasoning medical logic on account of numbers of examples; certainly it is not scientific. Gold fillings, gold caps, gold crowns, etc., "made by the ablest men" in dentistry in England, Germany, France or even America, and made after the methods which he credits as American dentistry, cannot produce pyogenic organism nor supply nourishment for their multiplication. Even as traps, "gold traps," they could not hold them alive till the trapper came around. The picture the doctor draws of gold traps is in reality only a clap-trap to catch the public or the unscientific, and while mechanical contrivances for the mouth and teeth may, when ill applied, cause irritation to surrounding live tissue, and inflammation, Nature's method of repairing the injury may follow and infection may occur, it is not the septic dental surgery, especially "American Dentistry," that should be blamed for the "oral sepsis." Every educated dentist must feel angry with Dr. Hunter, not for his earnestness in making war upon sepsis, but for his false reasoning and his puerile logic. How can an observing and conscientious dentist respect the truth of the statements about the diseases which Hunter claims to follow oral sepsis if the doctor can be so lacking in diagnostic acumen in a place where millions of cases are presented with opposite results and where an entire well educated specialty of medicine can be called as a witness of the false statement?

IRRESOLUTION is a worse vice than rashness. He that shoots best may sometimes miss the mark; but he that shoots not at all can never hit it. Irresolution loosens all the joints of a state; like an ague, it shakes not this nor that limb, but all the body is at once in a fit. The irresolute man is lifted from one place to another; so hatcheth nothing, but addles all his actions.—Feltham.

NATIONAL DENTAL ASSOCIATION.

NOTICE TO THE PROFESSION.

In justice to the Association, Dr. Johnson and the profession, it has been deemed advisable to send a statement to all the Dental Journals, for publication in their October issues in order that the Dental profession, in so far as possible, may be correctly informed concerning a widely circulated report that the National Dental Association took official action at the Cleveland meeting condemning tooth powders, pastes and mouth washes.

Dr. C. N. Johnson, of Chicago, read a paper entitled ''Mistakes, Common and Uncommon,'' from which the following is quoted, this being the only part of his paper which refers in any way to this question:

''And in this connection there is another mistake which the profession is fostering and to which attention should be called. This is the constant use of mouth washes among our patients irrespective of whether or not they are indicated. I am far from condemning the legitimate use of carefully prepared stimulating and antiseptic solutions in those cases where the abnormal conditions in the mouth indicate such treatment, but mouth washes should be limited to their proper indications and should be eliminated from use in healthy mouths. Their use in these cases has a tendency to do more harm than good. If the mouth is healthy there is always the danger of disturbing the normal balance by the introduction of agents which tend to interfere with function. The maintenance of function is the surest way to health, and consequently the healthiest mouth is the one which function is most fully performed. The best stimulant for the gum tissue and the best polisher of enamel is the friction of food in the function of mastication, but unfortunately mastication is not always carried out to its fullest efficiency. Therefore we use tooth brushes to make up this dereliction, and the moment we begin to depend upon solutions and washes to do the work which should be done mechanically by mastication and the brush that moment the tissues begin to deteriorate. I am not arguing against the use of a wash where the tissues are inflamed and the gums puffed and swollen, nor am I criticizing, as some have done, the mouth washes which are on the market today, many of which seem to be carefully compounded, but I venture to suggest that if the patient could be prevailed upon to have all irritants removed from the teeth in the way of deposit and the gums properly stimulated by massage and the friction of food and the brush that the restoration to health would be just as certain as by the use of drugs, and it would be more permanent. But just here is the rub. It seems so hard to get the average individual to properly care for the teeth and gums by mechanical means unless some powder, paste or wash is prescribed as an incentive. In this particular these agents have been useful. They have been the means of inducing many negligent individuals to take care of the mouth, when otherwise it would have gone neglected. Most of them are prepared with a pleasant flavor and they leave the mouth with a refreshed and wholesome feeling as is so often expressed by the patients.

''But the whole tendency of our teaching should be in the direction of preserving the normal balance between function and health rather than glossing over conditions by a false reliance on drugs. It is too much akin to the habit of using powerful and not always pleasant perfumes as a substitute for good, honest cleanliness of person. The individual who carries with him the odor of the bath has little need for musk, and he whose teeth and mouth are kept constantly clean is seldom obliged to resort to the 'dopeing' of drugs.''

In addition to this the official stenographer writes that one of the discussers stated ''that water was the best thing to use in brushing the teeth.''

This paper was read before Section 2 and did not come before the Association in any other way, and no official action, as some of these reports would seem to convey, was taken by the Association. Fraternally yours,

A. R. Melendy, President.
H. C. Brown, Rec. Sec'y.

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The Secretary-Treasurer of the Association is also a member of the Board of Governors, making thirteen in all.

NATIONAL ASSOCIATION OF DENTAL FACULTIES.

At the 28th annual meeting of the National Association of Dental Faculties, held at the Hotel Hollenden, Cleveland, Ohio, July 21st, 1911, the following officers and committeemen were elected and appointed for the ensuing year:

President—Dr. C. R. E. Koch, Northwestern University Dental School, Chicago, Ills.

Vice-President—Dr. W. E. Willmott, Royal College of Dental Surgeons, Toronto, Canada.

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NATIONAL DENTAL ASSOCIATION.

PUBLICITY COMMITTEE.

The dental educational series, now running in the newspapers in Illinois and Indiana, has been accepted by the Western Newspaper Union, 521 West Adams street, Chicago, as a part of their regular service. They are fully equipped to handle this matter expeditiously.

All advance orders that have been sent me will be filled at the Western Newspaper Union as soon as shipping arrangements are completed for the different states.

As this work has now passed into their hands, any who are interested should address their correspondence to them.

Urbana, Ill C. B. Warner, Chairman.

NATIONAL DENTAL ASSOCIATION.

MEETING OF THE EXECUTIVE COUNCIL.

There will be a meeting of the Executive Council of the National Dental Association November 4th, 10 A. M., at the New Willard Hotel, Washington, D. C.

This meeting is called for the purpose of selecting Section Officers and Committees for the coming year, and was authorized by the Association at the Cleveland meeting. Members desiring to offer suggestions or recommendations in this connection should promptly communicate same to any member of Council, or the undersigned.

H. C. Brown, Rec. Sec'y.,
185 East State St., Columbus, Ohio.

MICHIGAN STATE BOARD OF DENTAL EXAMINERS.

The next regular meeting of the Michigan State Board of Dental Examiners will be held at the Dental College, Ann Arbor, commencing Monday, November 13th, at 8 A. M., and continuing through the 18th. For application blanks and full particulars address

A. W. HAIDLE, Sec., Negaunee, Mich.

NORTHERN ILLINOIS DENTAL SOCIETY.

The twenty-fourth annual meeting of the N. I. D. S. will be held on the third Wednesday and Thursday (18-19) of October in Rockford.

A program of unusual interest has been prepared and the members of the profession are requested to be present.

EDMUND NOYES, Pres.
F. H. BOWERS, Sec.

UTAH BOARD OF DENTAL EXAMINERS.

The Utah Board will hold its semi-annual meeting in Salt Lake City November 7th and 8th for the purpose of examining applicants who desire to practice dentistry in Utah. For application blanks and further information address A. C. WHERRY, McCormick Bldg., Salt Lake City.

OHIO STATE DENTAL BOARD

The regular fall meeting of the Ohio State Dental Board will be held at Hotel Hartman, Columbus, O., on October 17-20 inclusive. Applications must be returned to the secretary, with the fee of twenty-five dollars ($25.00) no later than October 7th.

All persons desiring to secure license should send for an application blank to the secretary, L. L. Yonker, Bowling Green, O.

WASHINGTON STATE BOARD

The next meeting of the Washington State Board of Dental Examiners will be held in Spokane on Nov. 9th, 1911.

Enclosed you will find a set of the rules. Please state rule 4. It is the law and we have no choice in the matter. I am continually asked this question.

4. No temporary permits or licenses will be granted under any circumstances whatever. F. G. TITUS, Secretary.

ARKANSAS BOARD OF DENTAL EXAMINERS

The next meeting of the State Board of Dental Examiners will be held in Little Rock, Ark., Nov. 20 and 21. All applicants are required to pass an examination to obtain a certificate. Examination fee $15.00.

E. H. JOHNSON, D. D. S.,
Citizen's Bank Bldg., Pine Bluff, Ark.

THE DENTAL SUMMARY

The Magazine That Helps

Vol. XXXI NOVEMBER, 1911 No. 11

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REGULAR CONTRIBUTIONS

THE CEMENT LINE IN INLAYS

By Clarence J. Grieves, D. D. S., Baltimore, Md.

(Continued from page 685, October Summary)

Mention has been made of the shelter afforded under the normal gingivus, for here the butt-joints, as indeed joints of all operations, are at their best, and a word is necessary as to the causes for that immunity. In a report made on "The Behavior of Certain Metals in the Mouth,"[4] the writer found all vulnerable metals, as gold alloyed with zinc in solders and gold-plated german silver, as "D" bands in orthodontia, showing deep destruction of the metal just at and above the gingival margin and perfect conservation of the metal as when first placed below the gingivus, this occurred only in the normal gingivus, any irritation from fitting the band interfered with this function, when the metal was quite as much eroded as that exposed to the dangerous line directly above the margin.

It was further proven that vulnerable metals, when in fixed actual, but not pressure contact with the mucosa were not affected by the degeneration from mouth juices, which quickly attacked them at exposed parts; this was shown by a series of experimental bridges, the saddles of which, made of vulnerable metals, were placed in contact with the membranes covering the ridges; removed and examined from time to time it was found that they were clean and undamaged, where in good contact, but the exposed edges buccally and lingually were eroded. It was reasoned and so reported,[5] that this immunity might have been due to the alkalinity common to all normal mucosa, but more than likely it is an illustration of the immunity conferred on all of the mouth mucosa by the constant chemiotoxis of the leucocytes. Movable membrane contact is most damaging in carious environs, witness the record written on many buccal surfaces of permanent molars as they erupt and are exposed to it in the child mouth—due to the retention afforded by the cover of the commissures. The long record of both butt and lap-joints in crowns carefully set without irritation under the gingivus, is most convincing; the cement line will stand under the protection of the gingivus in the butt-joints of comparatively flat copes of all porcelain crowns and in the lap-joints of banded crowns, the best of which are far inferior to the poorest joint made in the inlay; this might be explained, to a degree, by the protection afforded the cement by crown contour from bite stress, but for the fact that as soon as gingival recession occurs, caries recurs promptly proximally, which is also true of all operations in this locality in carious mouths. But whatever the cause for this immunity afforded by the normal gingivus, all agree that it exists, and that all operations should be put under its cover without damage to it, when possible.

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[4] Grieves, C. J.—The Behavior of Certain Metals in the Mouth. Proceedings, National Dental Association, 1909.

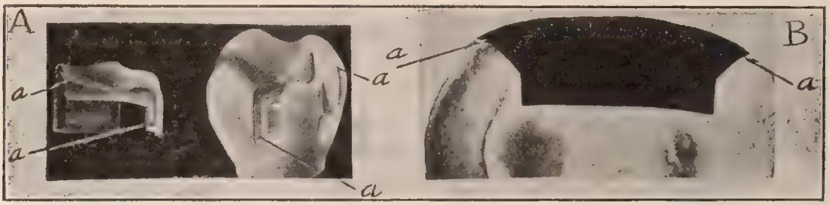

Fig. XIV

Fig. XIV. From Conzett's article, "Gold Inlays," *Items of Interest*, to show ideal lap-joint at "a."

From Black's "Operative Dentistry," wrong lap for foil operation but right lap for gold inlay at "a."

Lap-joints, Fig. IV. B, when correctly made with the metal ductile enough and in sufficient bulk to be well "spun" and burnished over the cavo surface angle retaining and protecting the cementing media, this grinding over and burnishing doing damage to but the finest external line of cement, the rest of which is protected thereby, Fig. XIV., are the writer's ideal, and in his judgment a long step to the final solution of this problem, Fig. XV.; after a long and careful study of lap-joints tested side by side with butt-joints, often in the same filling, Fig. XVII., in both the mechanical and chemical areas, they present conditions which are most satisfactory, Fig. XVII. There is little or no loss of cement from the lave of bite stress, for the reason that it is sheltered under the cover of the properly finished ''lap,'' hence we may follow the laws of Black and extend occlusally, Fig. XVI., and into the embrasures; again, when the lap is properly finished—at no time an easy thing—the loss of cement by solution in the dangerous chemical areas is slight, while, of course, in these areas, under certain mouth conditions, all operations fail, they stand up just as much better to the attack as the butt-joint stands better than the contact operation, Figs. XVII. and XVIII. The metal in the lap-joint must meet all requirements for perfect contact finish; there is only one such, in the opinion of the writer, and that is pure gold, alloying of which seriously interferes with marginal adaptation, just as it does in foil operations, Fig. XIV.; in fact, one of the principal arguments for the lap-joint is to be found in its perfect protection of the enamel rods of the cavo

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[5] Grieves, C. J.—A Review of Bridge Work.—*Dental Brief*, Sept., 1910.

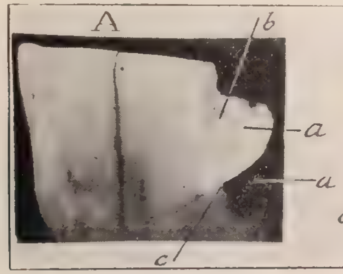


Fig. XV

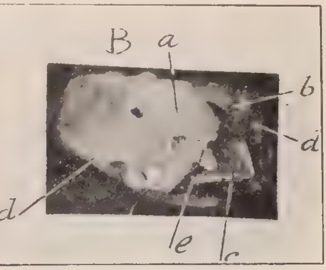


Fig. XVI

Fig. XV. Section gingival third gold inlay disto-proximal right superior central showing ideal butt-joint conditions; ''a'' gold inlay, ''b'' dentine and cement, ''c'' butt-joint.

Fig. XVI. Section at the linguo-occlusal angle superior first bicuspid, showing successful long lap joint of a gold inlay, mouth environs bad; time, nearly four years; ''a'' cross section of enamel of the linguo-occlusal angle, ''b'' lap joint, ''c'' body of inlay, ''e'' cement in joint complete almost to cavo-surface angle, ''d'' investing cement to retain parts while honeing.

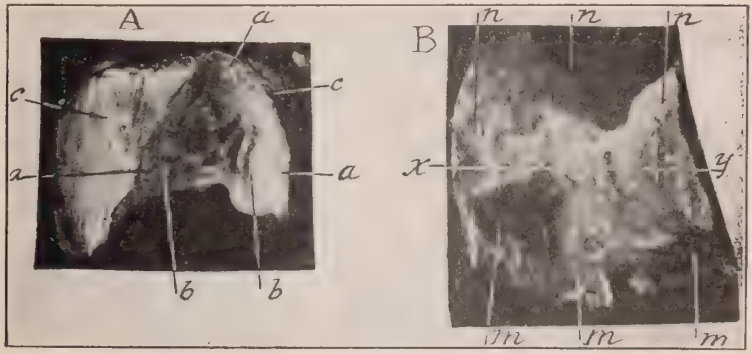


Fig. XVII

Fig. XVII. A—*Lingual view* of a mesio-disto-occlusal gold inlay, right superior first molar in use six years; ''c'' gold inlay surface, ''b'' caval cement in good condition because of perfect protection of the lingual wall by good lap joints at ''a.''

B—*Caval view* of same filling. The caval cement is intact on the lingual filling surface at ''n'' to the line x-y dividing the inlay mesio-distally. The buccal wall was protected only by a butt-joint and it will be noted that all of the caval cement buccal to the line x-y is either washed out or stained at ''m.''

surface angle. The failure of the lap-joint is largely one of technique, and occurs, strange to say, just where the butt-joint is at its best, under the normal gingivus; a greater number of failures are here to be reported than at any other point, for the evident reason that the correct setting and finishing of the lap under the gingivus without damage thereto or "over-flange" causing retention, is one of the most difficult procedures in operative dentistry, Fig. XIV., and needs much betterment.[13]

It might be appropriate in this connection to mention the method applied by Levi C. Taylor for small operations, as of building the filling of gold, usually of the crystal types, in the midst of setting cement to a moderate lap-joint, Fig. XIX.; a number of such have been examined, and they seem to combine the advantage of both the inlay and contact operations, also amalgam fillings after this method built of quick-setting alloy in slow-setting cement, Fig. XX., with the help of an oiled matrix, finishing to the least bit of a lap of the cavo-surface angle; under particularly unfavorable mouth conditions these fillings do well, and the writer believes that every amalgam filling should be thus cemented in.

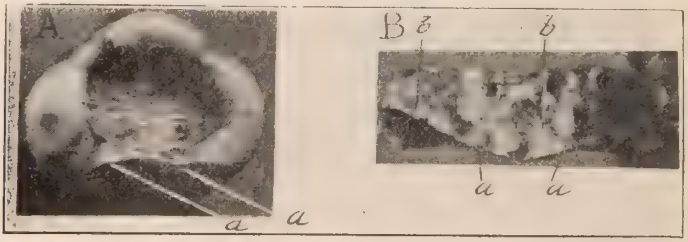
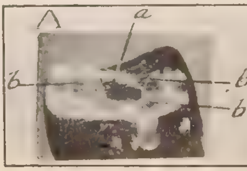


Fig. XVIII

Fig. XVIII. A—Looking into an occlusal cavity in a molar filled four years with lap-joint gold inlay, of which a section has been cut at the disto-buccal cusp, showing perfect condition of cement at "a," in fact through the whole cavity.

B—View of the lingual wall of the inlay which filled cavity shown in A. Note the lap-joint which has stood heavy morsal stress with the loss of but little cement at "a," the rest of the cement "b" is in good shape.

Reference has been made to the vulnerable chemical areas, and we find mouths where all areas are vulnerable, in others chemical solution is localized; when we realize that the cement-line is continually bathed in saliva, a fluid constantly changing to reflect systemic conditions, some



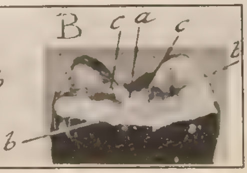


Fig. XIX Fig. XX

Fig. XIX. A—Section cut through an occlusal filling of crystal gold condensed into setting cement, extracted and stained; "a" gold filling, "b" cement which is perfect. Note the conditions at the cavo-surface angles.

Fig. XX. Similar section through an amalgam filling made after the same method, same time in the mouth, similarly stained; "a" amalgam, "b" cement, owing to contraction of amalgam stains at "c," but no caries.

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[13] Lane, J. G.—A Comparison of Differences of Opinion.—*Dental Brief*, Feb., 1911.

classification of mouth types, broad and necessarily defective though it may be, is here necessary, to a further study of the subject. While comparatively little is known of mouth conditions—for instance, caries of the enamel is yet unsolved—certain data is at hand, thanks to the efforts of many authorities, particularly Miller, Williams and Black, Michael, Kirk and Low, and the writer presents this diagrammatic scheme with apologies to these investigators.

We may divide mouth types systemically into the Normal, the Hypo-acid and Hyper-acid, as follows:

SCHEME OF MOUTH TYPES AS ASSOCIATED WITH THE SYSTEMIC STATE

NORMAL

MOUTHS—Can be kept clean.

SYSTEMIC CONDITION—Biochemical changes equally balanced.

SALIVA—Neutral or alkaline.

MUCUS—Alkaline; medium in amount existing independently in ropes depositing on all surfaces.

SULPHOCYANATES—Normal, glycogen and ammonia little or none.

CARIES—Medium in amount, dark and slow.

EROSION—None.

SALIVARY CALCULUS—Medium at the usual point.

SERUMAL CALCULUS—None, frequent sulphid and other stains.

FILMS ON TEETH—On all surfaces except occlusal; alkaline or acid according to percentage of glycogen, protective except in retention centers.

INLAYS do well, and butt-joints stand, but often stain; suffer most in the stress areas, slightly in the retention centers. Figs. V, VI, VII, XI, XII, XIII, XXI.

HYPERACID

SYSTEMIC CONDITION — Oxidation low; increase in organic acids; Biochemical changes slow; Arthritism, showing in two phases, Erosion and Pyorrhea.

"A" EROSION MOUTHS—Which look "too" clean.

SALIVA—Acid from acid sodium phosphates, clear and limpid.

MUCUS—None, that secreted is in solution.

SULPHO CYANATES in excess.

GLYCOGEN below and AMMONIA above normal.

CARIES—None.

EROSION—In excess on cheek or lip contact.

SALIVARY AND SERUMAL CALCULUS—None, no sulphid nor other stains.

FILMS ON TEETH—A few growths open to the wash of saliva.

INLAYS—Look well but fail, particularly butt-joints from all around solution of cement due to the acid-sodium salts; other operations do well. Figs. IX, X and XXII.

"B" PYORRHEA MOUTHS—Teeth dirty cervically from gingival waste and calculi.

SALIVA—Alkaline from tissue waste.

MUCUS—Sulpho - cyanates, glycogen and ammonia above the normal.

CARIES—Little, considering the numerous retention centers caused by gingival recession.

EROSION——None.

SERUMAL AND SALIVARY CALCULUS—In excess and recurring; staining from all causes.

FILMS ON TEETH—"Materia alba," greasy, alkaline.

INLAYS and all fillings do well except in marked retention centers, butt-joints stand almost as well as lap-joints, but stain.

HYPOACID

DIRTY MOUTHS—Cannot be kept clean.

SYSTEMIC CONDITION — Oxidation high—decrease in organic acids; increase in excretion of saline chlorids.

SALIVA——Neutral as secreted but acid, thick and ropy; odor and color from the *Mucus—which is abnormal* containing a high percentage of carbohydrates as excreted, highly acid, forming sordes.

SULPHO-CYANATES — And ammonia below normal.

GLYCOGEN—Greatly in excess.

CARIES—Excessive, rapid, white, and always recurs no matter what the operation.

EROSION—None.

SALIVARY CALCULUS—In excess.

SERUMAL CALCULUS—Occasionally, sulphid and other stains in excess.

FILMS ON TEETH—A "thick acid felt," everywhere; the ideal media for B. acidii lactici.

INLAYS WITH LAP-JOINTS do better than contact operations; butt-joints fail quickly, caries recurs at all points on all operations.

(To be Continued.)

CONSERVATION OF THE BICUSPID TEETH.*

By W. H. O. McGehee, M. D., D. D. S., Cincinnati, Ohio.

A PROMINENT writer, I think it was Doctor Davenport of Paris, has remarked that he could, by noting the state of preservation of the bicuspid teeth of a number of patients, tell whether they had had a good dentist. He meant by this that he could gauge the abilities of a dentist by simply examining the bicuspid teeth of his patients.

Did you ever think of that? At first thought it may probably seem a somewhat broad statement, but if you will investigate the matter for a short time with me this afternoon I shall prove to you its correctness and in so doing enter a plea for a closer study and a more humane interest in and treatment of this frequently neglected part of the human dental mechanism.

Let us briefly study some significant features with reference to the location, anatomy, architectural design and functions of the bicuspid teeth.

(1) *Location.* With reference to location I wish to bring to your attention some points which, as far as I know, have not been brought out by any previous writer. These teeth are placed in a position where, owing to their surroundings, they are markedly subject to the ravages of decay. As is well known, the action of the muscles of the lips, cheeks and tongue assists in the cleansing of the labial, buccal, lingual, incisal and occlusal surfaces of the teeth. Indeed the lower animals depend largely on the functions of these muscles in the performance of their dental toilet. In passing I wish to lay stress on the fact that the lower animals really do pay attention to oral hygiene, whereas, sad to relate, as you will all agree, many of the members of the human species, from the apparent conditions frequently seen in their mouths, do not even resort to this crude provision of nature already mentioned for the removal from their mouths of food debris, which, if left to ferment and putrefy, finally becomes filth. The anterior teeth, upper and lower, may be cleansed fairly well by the

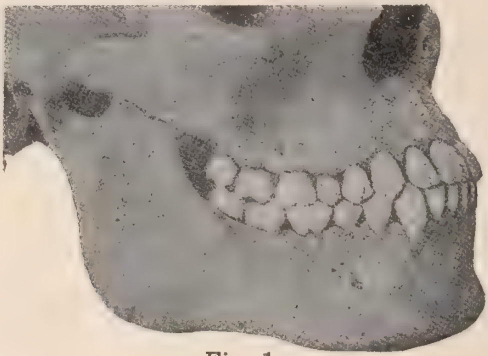

Fig. 1

Fig. 1. Showing less prominent position of bicuspids, upper and lower.

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*Read before the Eastern Indiana Dental Association, Rushville, Ind., 1911.

use of the tip of the tongue and the muscles of the lips—have you ever tried it? Their position is such that they may be readily reached by these muscles, but if you will try this same procedure on the bicuspids you will find that you do not get along so well. In the first place, the tip of the tongue is not so readily brought in contact with these teeth and the sides of the organ are not so active in their movements. Another thing — the bicuspids, as you know, are placed distal to the cuspids and slightly lingual to them, the cuspids being much more prominent. This being the case, the labial surface of the cuspids may be readily subjected to the cleansing action of the muscles mentioned, whereas the buccal surfaces of the bicuspids, owing to their less prominent position in the arch, are less readily reached.

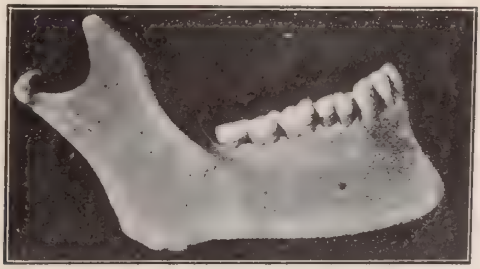


Fig. 2

Fig. 2. Showing same condition in lower jaw.

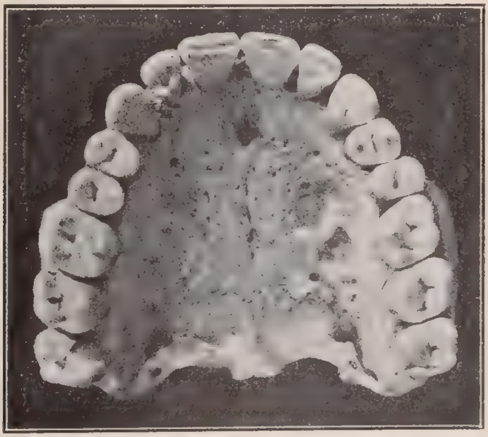


Fig. 3

Fig. 3. Showing less prominent position of bicuspids in arch. This is particularly noticeable on right side in this example.

If you will try this in your own mouths you will find that the centrals, laterals and cuspids are most readily subjected to this function, the molars next and the bicuspids least; the molars, presenting a greater bucco-lingual diameter, are in closer contact with the tongue, as well as the cheek muscles. In addition to this the muscles seem to be more active in the molar region.

Another point with reference to location to which I desire to call your attention is this: The secretions of the parotid, submaxillary and sublingual glands are being constantly poured into the mouth, and these secretions, in addition to their other functions, act as flushing agents to the teeth, assisting in the removal of accumulations from their surfaces. Now the duct of the parotid gland (Stenson's) opens in the region of the molar teeth—to be exact, opposite the upper second molar. The ducts of the submaxillary (Wharton's) and the sublingual (Rivini's and Bartholin's) empty their contents in proximity to the fraenum-linguae in the region of the lower anterior teeth. Thus do the bicuspids, from a strategical standpoint, again occupy a weak position in their daily battle against their common enemy, being so placed that they have to appropriate what flushing material is left them after their neighbors have used their supply.

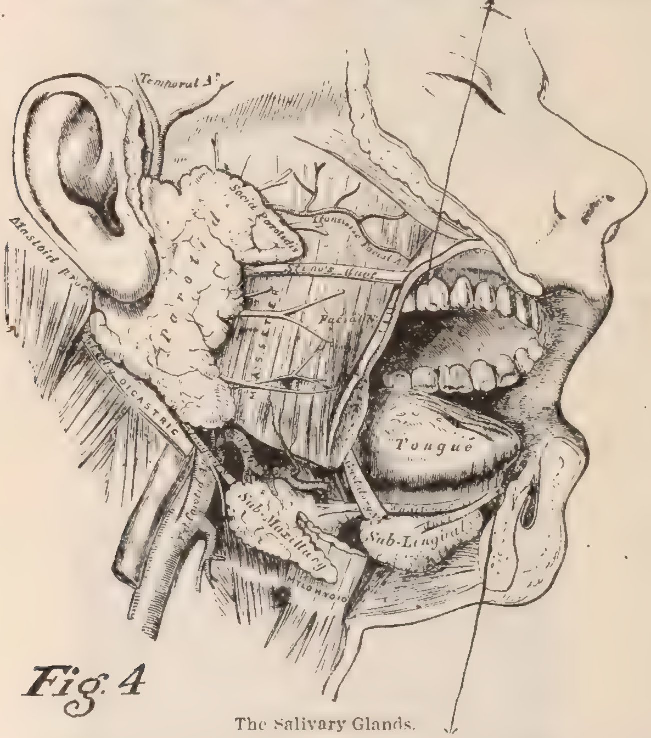

OPENING OF STENO'S DUCT OPPOSITE UPPER MOLARS

Fig. 4

The Salivary Glands.

Opening of Wharton's or Bartholin's and Rivini's Ducts Opposite Lower Incisors.

Fig. 4. Showing location of ducts to salivary glands.

Thus it is seen that Nature seems to have slighted these teeth as far as natural self-cleansing and flushing action is concerned, but she has endeavored to compensate for it in another way, as will be presently seen.

(2) *Anatomy and Architectural Design.* These teeth are exceedingly subject to decay in the pits and fissures located on their occlusal surfaces, the enamel in these locations being notoriously faulty, and if they are not

watched closely cavities of considerable depth make their appearance before we realize the necessity for radical measures. They present in the majority of instances a strongly bell-shaped crown, the mesial and distal surfaces receding rapidly to a small neck, thus forming a well-marked, V-shaped interproximal space. In quite a number of cases, though, the bicuspids are of the thick-necked variety and closely wedged into the arch, with a markedly indefinite interproximal space, into which the point of an explorer or other examining appliance is carried with difficulty. This being the case, cavities on these surfaces may progress to quite an extent before being noticed unless careful supervision is practiced on the part of the "keeper of the gate."

From an architectural standpoint these teeth are the most beautifully constructed of any in the entire denture, being wonderfully and strongly equipped by Nature to withstand the forces to which they are subjected. A study of their design reveals an exceptionally beautiful placement of buttresses and lateral girders, together with stanchions leading to a cervical girdle, which gives the entire structure an appearance of Gothic strength, as well as beauty, to delight the eye of the artist and architect. But just as if in the wonderful Gothic cathedrals and other structures, a survey of which delights the eye and leads to grand and noble thoughts, these buttresses and stanchions are not closely watched and protected from the ravages of time and decay, they will quickly succumb to their influences; so will these beautiful works of Nature which we are studying this afternoon, through the loss of a stanchion here or a buttress there, be weakened and tumble into ruins.

Fig. 5

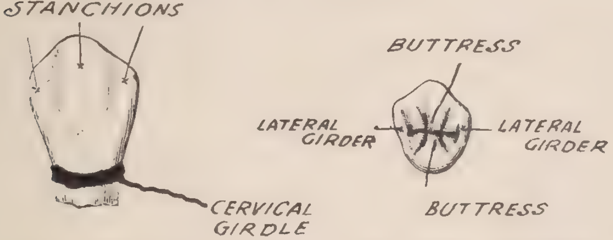


Fig. 6

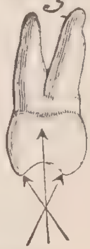


Fig. 5. Showing location of stanchions, buttresses and girders in the bicuspid teeth.

Fig. 6. Showing direction of stress on bicuspids.

The cusp elements, which present strong buttresses and stanchions, are also strongly bound together by two lateral girders (the mesial and distal marginal ridges), and if these are lost through any cause the tooth is very much weakened, the tendency being for the buccal and lingual cusps to split apart. I desire to mention this phase of the architectural design of the bicuspid teeth later in this paper.

(3) *Functions.* The bicuspids are intended primarily for the crushing of food before it is carried back into the mill to be further and more finely

ground and insalivated by the action of the molars. If any of the structural elements in their architectural design be weakened or lost, though, their functions are interfered with or crippled, and finally the entire teeth will succumb. How important it is, then, to preserve by close supervision all of these buttresses, girders and stanchions with which they have been endowed by Nature in order to maintain their integrity and continue their usefulness. "The stress upon the roots of these teeth is in three directions: Outward when the buccal cusps are in action; inward when the lingual cusps are in action, and there is a constant vertical stress. . . . . These facts are of direct clinical importance in the restoration of lost crowns by fillings or artificial crowns, for if the occlusal surfaces are not so arranged that the roots receive stress in all of these directions, and all stresses are not properly balanced, overstrain or disuse of some part of the pericementum follows." (Burchard.) This overstrain or disuse of the pericementum, in my opinion, is one of the frequent predisposing causes of what we know as pyorrhea alveolaris, and as has been brought out by Burchard, this should be constantly borne in mind in restorative operations on the bicuspids, as well as any other teeth.

From a close study of the location, anatomy, architectural design and functions of the bicuspids are revealed the following facts, viz.:

(1) From a self-cleansing and flushing standpoint, they occupy the weakest strategical position in the entire arch to resist the onslaughts of the enemies with which they are constantly battling.

(2) Owing to their close proximity to the Antrum of Highmore in the upper jaw and the Mental Foramen in the lower, they are quite liable to be associated with antral troubles and reflex nervous disorders, which may markedly lessen their period of usefulness.

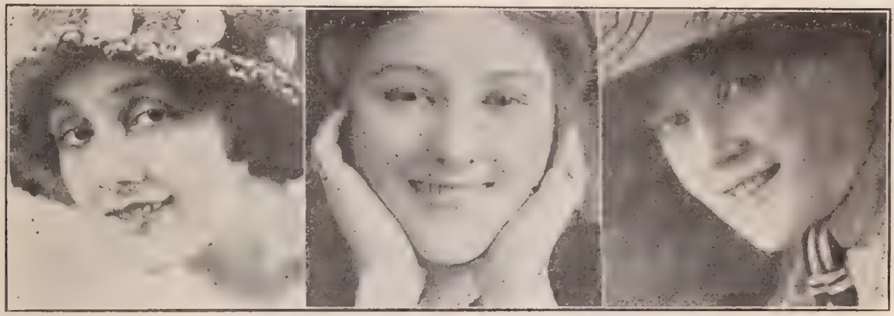
(3) Owing to the frequent possession of long cornuae, with consequent tendency to pulp exposure, together with the occasional possession of long, small canals (especially in the lower jaw) and the variations in conditions with reference to bifurcation of the canals in the upper jaw, they are markedly subject to pulp disturbances and affections following imperfect canal operations.

(4) Their strength to resist crushing stress depends largely on the system of stanchions, girders and buttresses already mentioned, which, if lost through any cause, markedly weakens them and shortens their period of usefulness.

With these facts before us, is it any wonder that they are liable to succumb early in life? Take them as a class and they are undoubtedly the poorest equipped by Nature to withstand the influences to which they are subjected, and for this reason do they undoubtedly deserve a great deal more care and consideration on the part of the dentist.

Now, will you mentally take a look into the mouths of your patients and decide for yourselves whether you can be classified under the title "good dentist" according to the indications mentioned in the beginning of this paper, or whether, on a close observation, you can picture many large, gold or amalgam filling restorations, inlays, porcelain or gold crowns or bridgework in the bicuspid region? Do you think either of the refined and beautiful young ladies whose pictures I present for your inspection would care to reveal an otherwise bewitching smile, the pearly whiteness of whose beautiful bell-crowned and symmetrically constructed bicuspids is marred by the presence of unsightly fillings or gold crowns, or of porcelain facings even slightly off color? All of you, even the married men, will answer "No!"

And yet the violent advocates of "extension for prevention" will tell us that this beautiful smile must be marred if a cavity of considerable size appears on an approximal surface of these bicuspids, *because they are liable to decay again some time.* They will cut across that marginal ridge, that lateral girder which Nature has put there to bind the cusps together and resist splitting stress. They will carry that buccal and lingual wall out, cutting through the upright stanchions to surfaces where the action of the cheek and tongue can keep them clean and in doing so turn the winning smile of a beautiful woman into the metallic grin of a hyena. Is it right? I tell you, *No!*



And how about the gold crown? I hate to mention it—I really do. And yet, are not these travesters on art, these fiendish inventions of an unrefined mind being spread broadcast over the land? And on the bicuspid teeth? And the man who makes them is, in his community, frequently considered what is known as a "good dentist." Is he? *Well, I do not believe he would have made even a good jeweler.*

I have endeavored to impress upon your minds the weak position these teeth occupy and the importance of an early and close, constant supervision over them. They should be sedulously watched from the time they make their appearance for the slightest evidences of decay, and patients should be especially instructed as to the importance of careful cleansing in this region.

Rigid examination should be frequently made of their approximal surfaces in order that the slightest softening may be detected. The use of a rapid separator should be resorted to during the examination if you cannot make sure in any other way that these surfaces are perfect. I wish to make a special plea against the *too great* extension of cavity margins in these locations. Anyone who advises the deliberate destruction of those stanchions, buttresses and girders, with which Nature has endowed these otherwise weak organs, is doing an untold injury and is laying the foundation for future trouble, which will surely follow from the splitting stress to which these teeth are constantly subjected. *Conservatism*, then, should be the watchword here, combined with careful and conscientious and frequent scrutiny. Large fillings, or inlays, or even crown operations may have to be resorted to later in life, but these should be postponed as long as possible. In some cases these teeth may be so far gone before they come under your ministrations that the mesial and distal marginal ridges are practically destroyed and the occlusal groove is affected. If you are a *real dentist*, and a *man*, your first thought will be, "Can I preserve the crown of this tooth by filling?" Or you may decide to resort to an inlay.

Whichever alternative you decide upon in this case, there is one point I wish to leave with you and it is this: In the preparation of your cavity, in addition to not extending it beyond the angles, be sure and form an absolutely flat seat and step. A filling or an inlay of this character, if placed on a rounded seat, will act as a wedge and early split the cuspal elements apart; whereas, one seated on an absolutely flat surface has not so much this tendency.

In conclusion I desire to repeat the premise laid down in the beginning of this paper, and leave for your consideration the following dictum, viz.:

The ability and character of the dentist may be gauged by an inspection of the state of preservation of the bicuspid teeth of his patients.

SYPHILIS IN DENTISTRY

By Starling S. Wilcox, M. D.

Lecturer on Genito-Urinary Diseases, Starling-Ohio Medical College, Genito-Urinary Surgeon to Grant and St. Francis Hospitals, Columbus, Ohio.

(Continued from page 703, October Summary)

Chancre of the tonsil may be so minute as to escape observation. Usually it begins as an ulceration, which may be small or large. Rarely, the appearance of the tonsil suggests diphtheria without the adherent membrane. Then again, there may be no ulceration, just a diffused redness, involving the entire tonsil, which then becomes universally enlarged, red and glazed. Owing to the location of the tonsil and its susceptibility to general engorgement, specific hardening is seldom detected.

The diagnostic points are early pain, difficult swallowing, feeling of malaise, slight fever, and the huge proportions attained by the parotid and the lateral cervical glands. In some instances the patient may appear to be suffering from mumps.

Chancre of the palate is usually a flat, circular, slightly elevated infiltration, whose surface is either deep red or grayish. In size it rarely exceeds that of a dime, and its general appearance may resemble that of an infiltrated mucous plaque. The glands beneath the angle of the jaw are early enlarged and there may be considerable pain in the parts.

Chancre of the gums is extremely rare and has the appearance of an erosion surrounding the roots of several teeth. There is considerable inflammatory engorgement between the gum and the cheek, and typical induration is rarely detected.

Chancre appearing upon the skin takes on the characteristics of the erosive or Huntarian chancre. It begins as a small, definite, rounded spot, which looks as if the horny layer of the epithelium had been removed. It is superficial at first but soon becomes raised upon a hard base. The shape of this lesion is round or ovoid, and its floor is slightly, if any, excavated. The surface is smooth, polished, deep dull red, often coppery, with parchment-like induration, and is usually destitute of granulations. The secretion is scanty. The characteristic induration of the Huntarian chancre is well defined and sharply limited to the erosion, differing from inflammatory infiltration, which shades off gradually into the tissue.

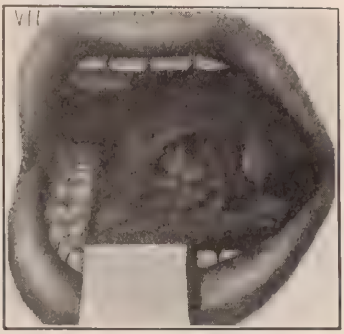


Fig 7—Chancre of tonsil.

Secondary mucous membrane lesions are the same as those of the skin, being modified in appearance by friction, heat, moisture and delicacy of structure upon which they are located. The most important secondary lesions are erythema, simple and ulcerative; mucous plaques; ulcerating syphilide; fissures and leucokeratosis. Smokers patch should be included in the description of these lesions.

Erythema is oftenest present upon the arch, soft palate, tonsils and pharynx, named in the order of frequency.

It may appear as a diffused hyperemia of dark color; as circumscribed rounded red spots which become confluent, forming patches with smooth, sinuous, convex outline; or as a scattered punctate eruption, which may also attack the cheeks. There may be interspersed congestive areas which, under irritation, become denuded and finally ulcerated.

Erythema may be readily mistaken for the congestion of a severe cold. The presence of narrow, dusky red bands of inflammation along the border of the velum, ending abruptly at the base of the uvula, with uvular engorgement, serves to distinguish the diffused dark and punctated patch forms; while the situation of the erythemato-erosive type upon the cheeks or at the junction of the hard and soft palate, together with its well defined outline ending abruptly and not shading off gradually into the surrounding tissue, aids in distinguishing it from catarrhal angina.

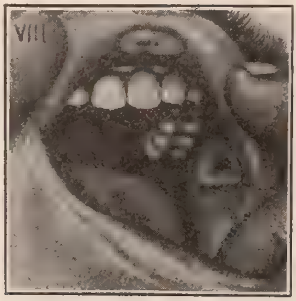


Fig. 8—Mucous patches.

Mucous plaques, also called patches, are caused by hyperemia and proliferation of cells in the mucous layer. Plaques are really modified papules and may occur anywhere in the buccal cavity, the favorite locations being on the inside of the cheeks, particularly at the angle of the mouth, upon the lips, the tongue, the gums, the uvula, the tonsils, on the pillars of the fauces and the hard and soft palate.

Fig. 9—Mucous patches of the lips.

The first evidence of the mucous patch is a rounded and reddened spot which may be single or, more commonly, multiple. Though more or less regularly circular in outline, it may be oval and at times irregular. It is either flat, smooth and even with the surrounding surface, or may be raised above the level. As the red spot develops, serum exudes and young cells are deposited, giving the characteristic appearance of the affected surface. The patches are of a grayish-white color, looking as if the mucous membrane had been touched with nitrate of silver or carbolic acid. The lesions are often symmetrically located, or one upon the tongue will correspond to another upon the gum or lip, suggesting auto-inoculation, but the true explanation is found in contact irritation, since it is a common observation that a plaque is very likely to form where a rough tooth impinged upon the cheek or tongue, and upon that portion of the dorsum of the tongue where the pipe stem rests; in the commissure of the lip upon the side where the pipe is held; upon that part of the tongue where the hot tobacco smoke comes in contact; and in the angle of the jaw where the last molar makes pressure upon the gum.

The papular plaque is caused by small-celled infiltration of the papillary body and increase in the mucous papillae. This type rarely remains unchanged. It may disappear spontaneously but much more commonly becomes covered with a whitish or grayish film or false membrane, constituting the diphtheroid variety.

The papulo-erosive plaque is the most common form of mucous patch. It is caused by the removal of the skim-milk-like film coating of the papular patch, and is recognized by its varnish-like, moist, shining, bright or brownish red surface and its sharply circumscribed infiltrated base.

The papulo-hypertrophic plaque forms when interstitial hyperplasia takes place. The papillæ elongate, the epidermic layers remain unshed, and the superficial epidermis thickens. This variety exists, for the most part, upon the tongue, and especially upon its under surface. It is seen, too, upon the lip, the vault of the palate and the uvula. The surface of this plaque, showing a tendency to spread at the periphery, is irregular from the unequal length of the elongated papillæ, and it may be either covered with a grayish membrane or show erosion. In the angle of the mouth this form may spread to the skin surface, and while the mucous portion is covered with a grayish membrane, the outer part will be crusted with a dry brownish-yellow deposit. The patch is usually accompanied by a deep and painful fissure extending into the mouth, a condition which serves to distinguish it from the simple herpetic and aphthous ulcer.

Vegetating or cauliflower mucous patches occur when the elongated papillae become separated into small groups. These differ from the others inasmuch as the patches become split up and separately covered with epithelium. The lesion, as a whole, produces upon the dorsum of the tongue the so-called "toad's back."

Papulo-ulcerative plaques form when any irritant, such as a decayed tooth, has produced its effect upon an eroded, luxuriating or resolving papule. Uncleanliness, the use of tobacco, etc., may also cause them. The ulcer is superficial but quite painful from the same irritation which caused it, or from the condiments in the food eaten and the muscular drag during the act of masticating and swallowing food.

The ulcer is below the level and has a yellow base, closely simulating the herpetic and aphthous ulcer, but the presence of the papule before ulceration began is positive evidence of its syphilitic origin, for other ulcers do not begin that way.

Buccal mucous patches are usually not hard to recognize. One of the chief points of distinction between them and lesions similar in general appearance is the absence of a surrounding inflammatory zone.

Exfoliatio-areata-linguæ differs from the picture presented, by several plaques coalescing upon the tongue and forming an irregular area with polycylic margins, inasmuch as the former begins as a rounded, yellowish-white patch, which exfoliates on one side as far as the center, spreading in the opposite direction and leaving a denuded surface behind, which is smooth and somewhat redder just within the ring segment. A number of broken rings may festoon the margin of the tongue or, running into each other, produce irregular figures, but as these are constantly changing their position and shape, a few days' observation will discover the difference between this condition and that of coalesced syphilitic patches, which remain more constant in configuration.

There is little to distinguish the ordinary canker sore from the ulcerating papule and concomitant evidence must be relied upon. The patient may, however, state that the ulcer is quite tender, whereas the specific ulcer is not so often complained of except during the act of eating. If the lesion is syphilitic, microscopic examination of its serum will reveal the spirochetes.

The aphthous ulcer is frequently mistaken for the syphilitic lesion but should not be if it is remembered that the former is usually perfectly round, scooped out, with a decidedly yellow or golden base and has a bright red areola.

Ulcerating syphilide may occur anywhere in the buccal cavity. It is not a variation of the mucous plaque but due to spontaneous breaking down of the part involved.

Shallow ulcers are found upon the lips, cheeks, and pillars of the fauces, usually multiple, but sometimes existing as a large superficially ulcerated area with irregular borders, especially upon the arch of the palate, and showing red dots of papillary growth pressing through the yellowish or grayish base. The bottom of a fissure upon the tongue or lips often becomes involved, the resulting ulcer being painful.

Fissures often complicate infiltrations and the mucous patch. They may appear in the lips or tongue.

Some of the fissures in the lip may extend deeply into either the mucous or the skin surface and, from occasional hemorrhages mixed with the secretions, become covered with a dirty brownish-red scab.

Upon the tongue the fissures are frequently the site of narrow whitish plaques which recur continually, the membranous deposit dipping down and carpeting the base of the fissure. Upon the dorsum the clefts may form wherever a small-celled infiltration or smooth plaque has existed, and such fissures may be star-shaped or longitudinal in the axis of the organ, looking as though the tissue had been severed with a knife. The walls lie together and only disclose the depth of the fissure when separated by the fingers. Such fissures may leave permanent scars in healing which will, for all time, bear evidence of the disease having existed.

Leucokeratosis, also called keratosis, opaline plaque, milk spot, leucoplakia, leucoma, leucoplasia oris, tylosis, and smokers' patch, may appear anywhere in the buccal cavity, though most frequently seen upon the tongue. A better understanding of this lesion may be had by a study of the following deductions:

1. Syphilitics are predisposed to the changes induced by smoking, and are more likely to suffer than others from the true smokers' or nicotine patch.
2. The use of tobacco predisposes to syphilitic changes of a very similar nature, which are difficult to cure so long as tobacco is used.
3. Combinations of two distinct processes or mixed forms may exist.
4. It is possible for a man who has, or who has had, syphilis to suffer from a leucoplakia of non-syphilitic nature.

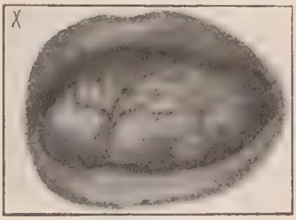


Fig 10—Leukoplacia of the tongue.

Leucokeratosis is seen almost exclusively in male patients and the mixed type is that most often encountered. The effect of tobacco and syphilis are so habitually combined that one would be led to look upon smoking as the exciting cause.

Leucokeratosis linguæ occurs upon the tip, dorsum or borders of the tongue, as rounded or irregular and sometimes gyrate patches which may, by confluence, cover almost the entire surface. At first they are smooth, flat, shining, and may even appear as dull, rosy spots. As the lesion increases at the periphery the central epithelium may be cast off, leaving inclosed a group of bright red papillæ which are swollen and tender and, if sufficiently irritated, become excoriated, bleed easily, form a dyphtheroid coating, or ulcerate. If this course is not pursued, the lesion may persist as a slowly thickening and extending bluish-white patch which may become fissured. When the whole, or the greater portion, of the dorsum of the tongue is involved, the appearance may be that of a tongue closely shaven of its papillæ and coated with a thin layer of collodion, through whose bluish tinge the red surface beneath is seen. In a more pronounced form, the center of the dorsum may look as though brushed over with white paint, leaving a yellowish-white margin. Fissures, longitudinal and transverse, are frequently seen.

Leucokeratosis buccæ is commonly observed on that portion of the cheek which lies opposite the line of contact of the teeth when the jaws are closed. Beginning at the commissure as an opalescent or skimmed milk, rounded, radiating, or irregularly shaped plaque, it may increase by the formation of new plaques or by extension, until the whole region lying between the separated jaws, as far back as the last molar, is involved.

Smokers' patch begins as a slightly uneven, smooth or wrinkled area, which appears to be somewhat elevated above the general surface. It often becomes superficially ulcerated, and cracks and fissures are frequently seen crossing the white surface. The lesion is usually confined to the anterior portion of the tongue.

A careful comparison of color and configuration shows so little to differentiate between simple smokers' patch and the syphilitic patches that it becomes the part of prudence to consider all buccal patches syphilitic until proven otherwise.

Occasionally the dentist is called upon to treat dyspeptic, anemic, diabetic, debilitated and alcoholic individuals who may present a soggy, dull red, more or less irregularly distributed coating of thickened epithelium, covering the mucous membrane of the cheeks and lips. From the habit of pressing the cheek against the teeth and nibbling off portions of the macerated tissue, denuded red areas of irregular shape and distribution may appear scattered over the bluish patches. Then again, in some smokers, there may be a persistent clouding of small areas, with casting off of the epithelium; and, following the persistent rubbing of a tooth against the cheek, there may be circumscribed thickening, even a warty-like growth. These manifestations should not be mistaken for the lesions of syphilis, which are drier, more shiny, opalescent or silvery.

(To be Continued.)

INFECTION AND PATHOLOGY OF GUMS AND SOCKETS*

By T. B. Hartzell, D.D.S., Minneapolis, Minn.

HAD I possessed the courage to have declined the delightful invitation that Dr. Fletcher gave me to appear before your association, I should not now find myself before you without a prepared paper. I explained to Dr. Fletcher that I could not write a paper for the occasion, but he insisted that I should speak upon the subject of Infection and Pathology of Gums and Sockets, even though my talk should be off-hand.

Without further apology I will take up the subject assigned me and will first direct your attention to the etiology of the subject, because we all recognize the fact that the nature of pathological processes depends upon the etiological factor; for, "we do not gather grapes of thorns nor figs of thistles,'' and as the destruction of the alveolar process is so universal today, we needs must look for some great underlying reason to explain such a constant pathological lesion.

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*A talk before the Ohio State Dental Society.

I believe that the law of use and disuse as taught by Aristotle, and later spoken of by Darwin as the law of economy of growth, has a direct bearing upon the pathology of the gums and sockets, the idea of Aristotle being that we develop strength and ability just in proportion as we use our members and faculties, and Darwin brings out the same thought in regard to plant life.

If we look back over the history of the human race we find that the aborigines used their jaws and teeth in a vastly more efficient manner than we use ours today, and we find as a result of that fact that their jaws were thicker, with a deeper and stronger alveolar process than that possessed by the eaters of breakfast foods. This thickness and strength was in direct response to the demands made upon their jaws by the crude and rugged nature of the foods upon which they subsisted. Just in proportion as the labor of the jaws and teeth has been reduced by culinary art in the preparation of foods, so have the jaws and teeth declined in strength and resistance.

Nature will not maintain great bell-crowned teeth with thick, rugged alveolar process unless we demand it by vigorous use of the dental organs. This point is most graphically illustrated by the evolution of the teeth of the horse. In bygone ages, when the ancestors of the horse of today lived in low, swampy places where the vegetation was soft and juicy, the teeth were short crowned and not adapted for great wearing qualities. Through many generations and a greatly changing habitat the hypsodont type of tooth with which the horse of today is provided was evolved, adapted for reducing hard, resisting vegetable fiber. The law of economy of growth is also illustrated by the development of the feet of the horse from the five toes, capable of spreading out to support the animal on spongy ground, found in the earliest form; as the habitat changed there has been a gradual reduction in the number of toes until the horse of today has but a single useful toe on each foot, adapting it for speed on hard ground. Huxley said, "Show me a jaw and I will give you a history of the animal," and he is known to have reconstructed a prehistoric animal by having placed before him the jaw of that animal. Later the skeleton was found and the picture drawn so nearly coincided with the picture drawn from the actual skeleton that it was a very remarkable thing.

I have quoted Huxley chiefly to show that he considered that the life history of the animal was written in its jaws and teeth, and I have followed this line of thought to indicate to you that the great predisposition to destructive inflammations of the alveolar process, which we constantly note in our contact with our patients, is accounted for by the increasing disuse of the jaws and teeth.

We as practitioners of dentistry can counteract this tendency by influencing mothers to teach their children the proper use of the jaws and teeth and to teach our patients that they should each day partake of some food which requires forceful exercise of the jaws and teeth.

Now let us take up another line of thought regarding the etiology of lesions of the gums and sockets. It is futile to deny that inflammation of the gums and sockets is not at times due to direct constitutional causes as well as to purely local causes.

I have in times past minimized the effect of constitutional conditions in considering the pathology of the gums and sockets of teeth. I have minimized constitutional factors for the simple reason that the majority of inflammatory conditions met with in these tissues are due to local causes which can be readily controlled by the technical skill of the dentist; and because the dentist has had little or no faith in the possibility of combating the destructive inflammatory conditions which bring about the loss of alveolar bone. I endeavored to impress the general idea that the dentist can control these inflammatory conditions to a very great extent by utilizing his technical operative ability to remove the infectious material which is in part responsible for these lesions. With the end in view that if the dentist once realizes how much could be done locally instead of giving up the battle before he had even commenced the fight, he would, upon realizing how great a success can be obtained through local treatment, be ready to take up and study constitutional treatment.

With this brief word of explanation for what may seem to be a change of position from that maintained in former papers, I will discuss etiology from the constitutional standpoint.

It is a well-established fact that the various tissues of which the body is composed exercise special functions, certain groups of cells perform special functions showing a direct selective action for different substances; thus we have the glycogenic function of the liver and in the glomeruli and tubuli of kidney we find cells whose function is to abstract from the blood stream nitrogenous waste material, and so we can find example after example of the selective action of cell groups in the body for various substances.

This being true, it is equally fair and logical that certain groups of cells can and do suffer harm to a much greater degree than certain other types of cells can suffer from the same irritant.

This fact established in our minds, we can readily credit the fact that the tissues contiguous to the teeth can and do become irritated through the stimulation of waste materials brought to those tissues in the plasma of the blood stream, that these irritants brought to the tissues are of several different kinds, chief of which is the before-mentioned nitrogenous waste material. A second irritant is bacterial products from the alimentary tract elaborated there in those individuals of distinctly costive habit.

Third, we have chemical poisons, which directly affect the tissues immediately contiguous to the teeth, namely, mercury, phosphorus and lead poisoning.

So you see we have at least five sources from whence may come irritants to the tissues, which compose the gums and sockets, carried directly in the plasma of the blood stream.

PATHOLOGY AS REVEALED BY THE MICROSCOPE

These irritants in the blood stream act on the endothelium of the small vessels and capillary ends, causing cloudy swelling, which swelling lessens the caliber of these blood channels, blocking them up, inducing edema of the whole neighborhood supplied by them.

The condition is more marked about the teeth than elsewhere because so many small vessels penetrate and pass through the alveolar process to reach the peridental membrane. Swelling of their endothelium must occur inward, this resulting in an obliterating endarteritis. This is followed by the perforating canal absorption described by Talbot, which is nature's effort to open up the blood channels again.

Thus the alveolar process is drilled full of holes and torn down, to the end that the terminal vessels may again permit the movement of the blood to nourish the alveolar bone and peridental membrane. Therefore we see that the destruction of the bone begins when the circulation of the blood is blocked, and it does not matter whether the irritant is applied to the endothelial lining of vessels and capillaries or whether it be applied from without as one of numerous local irritants. The blocking of the circulation is the practical result, because lacunar and perforating canal absorption surely follow, so that the result is loss of bone.

An absolutely tense healthy pink gum always covers sound, healthy bone. Disturb the vessel endings and that moment you have initiated influences that induce destruction of the bone.

THE PART BACTERIAL INFECTION PLAYS

The question arises, do bacteria help to originate this condition? I think not, but they are responsible for the perpetuation of the disease when once an inflammation is established. I have made a great many inoculations in healthy gum tissues and find that, unless a previous inflammation existed, the tissues rapidly repair the damage done by such inoculation.

If we have some bone destroyed so that the root surface is open to infection, we find bacteria grow rapidly and may be found in the tissue. That bacteria are perpetuating rather than originating factors in the destruction of the bone would seem to be proven by the fact that when the root is stripped of the pitted porous surface, the bacteria which have gained entrance to the tissue are rapidly overcome and the destruction of the bone ceases, provided that the original cause of inflammation shall have been removed.

LOCAL CAUSES OF INFLAMMATION OF GUMS AND SOCKETS

Local causes, both direct and indirect, are many, and I have emphasized them so constantly that some of my friends seem to think that I believe and teach that rarefying inflammation of the alveolar process is due to local causes alone. This is not the case. Local causes are particularly to be combatted because about 90 per cent of the cases of inflammation of the gums and alveolar process yield to local treatment, and for that reason I emphasize that idea.

Local treatment is pre-eminently in the hands of the dentist. It is his own particular field. Constitutional cases have been left to the physician; so that with the dentist's lack of faith in local treatment and the physician's lack of knowledge of constitutional treatment, the average patient is permitted to lose his teeth. Hence I wish to stimulate interest in the matter of local treatment.

I wish briefly to mention a few of the many local causes of inflammation of the tissues contiguous to the teeth that the dentist can either remove or prevent; they are, sordes, particles of food left to decompose between the teeth, salivary and serumal calculus, lack of contact points, permitting food to drive in and bruise the gums, malocclusion, badly fitted crown bands, partial dentures; to this I would add the extraction of teeth, thus breaking the arch and permitting food to bruise the gum and the teeth to drift apart, causing resorption of bone on that side of the tooth toward which they drive, just as the application of force causes resorption of bone in orthodontia operations.

Last and most important of all in our list of causative factors is the pitted root surface with its dead peridental membrane. There are doubtless many other conditions capable of causing destructive inflammations of the gums and sockets, such as Ulcerative Stomatitis, La Grippe, Syphilis and all of the acute febril diseases. So that you see there is without doubt a multitude of conditions which may irritate the gums, and when the resultant congestion occurs destruction of the bone begins.

Now, then, it does not necessarily follow, as you may have been led to believe, that the removal of the cause results in a cure. It does not, because the moment you have removed any of the bone of the alveolar process, that moment these peridental membrane fibers that have been so ably pictured by an earlier speaker, die, because their blood supply is cut off and they are dead on the tooth's root surface; and furthermore, they putrefy, and as the mouth is a store-house of a great variety of bacteria, this dead material on the root surface becomes a perfect culture medium, and if the originating cause be removed infection still exists, because it has been planted on the root surfaces exposed by absorption of the alveolar process.

Thus a continuing etiological factor has been thrust into our problem so that the removal of the first cause is not enough to bring about a cure. We must free the root surface of all infectious material so that the root presents a brilliant, glistening white surface; a surface that can no longer harbor bacteria. Then the leucocytes can overcome the remaining bacteria in the tissues.

Here, then, is the first necessary step in the treatment of rarefying osteitis of the sockets. This surgical treatment must be followed by such vigorous massage of the gums that the over-filled vessels and capillaries are emptied of their fluid and the tissues steadily resume their normal appearance. This massage the patient must be instructed to do for himself. But we cannot stop here; we must restore normal occlusion and see to it that the weight of the mastication is evenly distributed on the occlusal surfaces of the teeth, and we must afford artificial support to all teeth that have lost enough bone to permit movement. Neglect any of these principles and we must fail. Observe them and success will surely be our reward.

To those who desire to adopt surgical treatment of root surfaces as a part of the treatment of rarefying inflammation of the alveolar process, I would give a word of caution regarding the histology of the cementum, namely: Do not cut too deeply.

NATURE OF THE ROOT SURFACE

A study of the cementum reveals the fact that it comprises three easily distinguishable layers. Overlying the dentine is the thick layer of atypical bone full of lacunae and canaliculi. Covering this and near its surface you find the bone grows more dense, so that it affords a foundation layer for the attachment of the peridental membrane fibers, which I would call the pitted layer, because when observed through a quarter-inch objective it looks like honey-comb.

In operating endeavor to remove all evidence of the fiber ends without penetrating the dense layer upon which it rests and which divides it from the lacunae of the cementum proper. If one just removes the porous layer without opening the cementum to infection one gains the best results.

I believe it is possible by too deep cutting to infect not only the bone cells of the cementum but to also infect the protoplasm in the tubuli. Not only that, but the pulp will become hypersensitive to all sorts of stimuli and the patient made to suffer a great deal of unnecessary pain thereby.

Elimination of root surface infection soon enables the soft tissues to repair, thus regaining a pink, healthy condition, and I would emphasize the very thing that Dr. Fletcher insists upon and has illustrated by the specimens he has shown here today, namely, that you can increase the resistance of the gum tissues by stimulation, artificially by massage, or directly by use.

There is another point I wish to speak of regarding the rebuilding of the process. Many of us have believed that alveolar process once lost is never rebuilt, but thanks to Dr. Fletcher's work, we have some evidence which he will doubtless present to you himself, that under certain conditions the process is rebuilt. My thought is that we ascertain just what is necessary to bring about rebuilding of the process.

In a recent consultation with Dr. L. D. Shepherd, who was a friend and colleague of Dr. Riggs, I learned that Dr. Riggs' methods were very vigorous but the result of his work caused the teeth to tighten, and I bring this thought forward at this time that it may be considered in connection with Dr. Fletcher's work, to the end that we may perhaps gain some sure and certain way to stimulate bone production.

Dr. Fletcher has a specimen which shows actual rebuilding of bone around a tooth where an attempt was made to extract it, and in which the process was crushed, and my observation is that when the bone is stimulated by a bur or curette we do find more bone built around these teeth than we do where there is no such stimulation. And it was with the end in view that we might get more light on that particular subject that this resume of conditions in the pathological equation of this disease was brought up, and I shall enjoy with a degree of keenness that is entirely out of proportion to my usual enjoyment listening to Dr. Fletcher's paper on the topic; because, as I understood, the idea was to bring out a rounded structure which would enable us to understand all the conditions and methods that will lead to the reconstruction of the alveolar bone; for we all know how to construct crowns and bridges and restore teeth that have been broken down, so that the entire mechanism is almost as good as before; but when the bone is lost then our work is ended, and if we can save the alveolar bone then a great step has surely been made.

ABSTRACT OF DISCUSSION

DR. W. G. EBERSOLE, Cleveland: As Dr. Fletcher stated, no paper was prepared and placed in the hands of the discussers, and of course we were somewhat at a loss to know just what Dr. Hartzell might say at this time; I have had no opportunity to talk with Dr. Hartzell.

It is not possible for any man to take up a talk like this and discuss all the phases of the question without consuming entirely too much time of an audience; therefore, inasmuch as I am not as familiar with the minute pathology and microscopic side of the question as those who are to follow me in the discussion, I shall let that side entirely alone.

Dr. Hartzell goes into the etiological side of the question, and I am very glad indeed that he takes up as the first point the question of use of the teeth and mouth, and inasmuch as my time has been devoted principally to the question of use and care of the dental structure, I am going to confine the most I have to say to that phase of the question, leaving the other side to the men who have been paying attention to the minute pathology and microscopic condition of the tissues. It is my belief, as Dr. Hartzell has said, that 90 per cent—I believe I quote correctly—90 per cent of the cases were cured in the mouth due to local treatment. I believe that more than 90 per cent of the cases originate from lack of proper use of the oral cavity, and I believe that a large percentage of those cases which are brought about by the constitutional conditions mentioned are also caused from neglect in the proper use of the first three inches of the alimentary canal. When we use tissue—when we use any part of the body for a certain purpose, that part of the body develops, as was said here this afternoon, to meet the conditions which are presented to it. Now, for instance, Dr. Fletcher spoke in discussing the last paper, of the soles of the feet, that if they were not used they would become as soft as the top of the foot. How many of you dentists assembled here this afternoon could go out into the street and take up a pick and dig, without causing blisters? I guarantee but very few, and yet after a short time, with the use of the pick, a man can use it and swing it all day and experience no ill effects so far as the hand is concerned. Now, infection of the gum tissues or the dental tissues of any kind will come about just in proportion as we neglect to prepare them to meet local conditions. If we fail to use those tissues as God intended we should use them, they are going then to become in a condition which favors abnormal conditions. The gums, I think Dr. Whitslar stated in his paper, become soft and flabby when not used; they do not hug the surface of the teeth, and they permit and allow food particles to gather around the teeth and you know what the result may be; while on the other hand, if we use these tissues they, by their own action, protect—not only protect but clean the surface. Dr. Fletcher stated this afternoon that there was no better cleanser than foodstuffs properly handled; and if we are going to handle or treat or care for the faulty oral conditions, the thing we must do and should do, first of all, is to teach our patients how to use the mouth for the purpose for which it is intended, and when a pathological condition exists, if you want to treat it successfully and have your treatment amount to something, have it a permanent affair, it will not do simply to remove the deposits around these teeth and make the treatments the doctor speaks of; but you must teach the patient to make use of these teeth any and all the time as they should be used if you are going to make a permanent cure. Now, I have had some experience along that line recently in taking up a class of children and attempting to produce data which will prove the actual value of dental service.

Up to the present time there has been nothing obtained anywhere which is going to show the actual value of dental service in dollars and cents, from an economical standpoint, and that is one of the things we want to accomplish if we want to make any headway in the Oral Hygiene wave that is going over the country. We took forty children having the worst oral conditions out of 886 pupils, and one of the first things we began to teach those children was how to clean the teeth, and the second how to use them; and it is astonishing—the most of you know that I am very enthusiastic—the change brought about by the proper care and use of the teeth, and I want to say to you at this time that we have obtained in that class of forty children—which has dwindled down to twenty-seven—conditions which have gone way beyond our fondest hopes as showing improvement. One of the principal things has been to place over them a nurse to teach them how to use the teeth and see that they do use them. After six months—though there is quite a little dental work still to be done—these mouths show healthy tissues where last April or May they were in a very, very unsanitary condition, the gums were soft and flabby. I can't take too much time in talking about that, but the conditions have been entirely changed and the great part of this has been in using the teeth, not simply just for chewing, but in placing the food in condition, where, when it went into the rest of the alimentary canal, it was prepared to meet the conditions there which would bring about constitutional conditions which favor the elimination of that matter that may influence oral lesions.

I want to say that I am very glad indeed to have heard Dr. Hartzell and to have him with us at this time.

Dr. M. H. Fletcher, Cincinnati: This subject involves factors in biology and must be considered from that viewpoint, but in doing so we are faced with our lack of much needed knowledge in the life history of the cell and the influence of environment and heredity upon it.

It is a great pleasure to hear Dr. Hartzell talk upon this subject, for I know he has done much work along this line.

He refers to the pits to be found on the surface of the roots and claims they can be a continual source of danger by holding and protecting bacterial colonies. What work I have done in bacteriology can make me understand this, although I have not investigated that particular feature of the roots.

Instead of depending on the root plane for sterilizing these surfaces as he does, after removing all deposits I polish with pumice and orange wood stick, then use such escharotics as tincture of iodine, lactic acid, and essential oils in alcohol, etc., the object in both methods being to get rid of the exciting and continuing causes of the trouble. These objects being accomplished, Nature will proceed to repair the damage by reproducing at least part of the lost tissues.

Studying the life history of infective bacteria means working in the border land of the unknown, and there never has been any greater pleasure to me than working in this field where the doctor has led us.

I am convinced that all deep-seated cases of alveolitis are perpetuated by bacterial invasion of some variety, and I have assumed that they may in some instances be due to the tubercular bacillus. for the physical conditions of the pathology of tubercular bone in other parts of the body seem identical with that in the alveolar process and maxilla, but the facts can only be determined by much careful research.

I presume infection in alveolitis comes under the head of ''Immediate'' causes, as compared with the ''Predisposing'' and ''Mechanical'' causes mentioned by Dr. Hartzell.

It must be borne in mind that the mouth is a most perfect incubating oven for bacteria, especially if it be unkept, hence the liability to infection where blood vessels and bone are exposed about the teeth.

The doctor referred to lead poisoning. I should like to ask if he knows of any data which would establish the fact that where these patients were exposed to the fumes of the metal there were no open wounds around the necks of the teeth; this is hardly probable, for workingmen, especially, are not likely to take much care of the mouth, hence their liability to poisoning by the fumes of lead or other poisonous metals. If the gums of these workmen were as healthy as they are found in these animals' jaws here shown, I believe they might be immune from the local symptoms, at least. This I assume on the principle that an existing lesion, or ''point of least resistance,'' is the first place of attack of many diseases. A perfectly healthy mouth in an adult human being is hardly to be found, hence when they are exposed to infections or irritants they are very apt to show local features of the disease.

I assume that the greatest protection to the gums and sockets, as well as to the teeth themselves, lies in the proper care of the mouth. Proper and prolonged mastication of suitable foods is of itself the greatest cleanser of the teeth and gums, as shown in these animals' jaws.

Dr. Hartzell uses the expression ''end organ.'' I have fussed with Dr. Talbot about his use of this term, he meaning in one instance, as I understand it, the blind ending of a capillary. In histology the term end organ refers to the end brush or bulb of a nerve branch. All blood vessels, either capillary or others, carry blood to or from the heart and their only normal endings are in the heart; they are thus a closed circuit. The cutting of any blood vessel means re-establishment of blood through the vessel or its obliteration down to the next bifurcation.

Infection getting into the blood vessels means they usually enter by metastasis, that is, going through the substance of the vessels just as we have diapedesis of the white corpuscles in inflammation, not through the open end of a blood vessel.

Dr. Hartzell refers to repair of the alveolar bone. I assume that bone repair will occur in the alveolar process the same as it will in other bones. I have X-ray pictures which show that it is repaired to some degree after treatment for alveolitis; I also have a section of a dog's jaw in which the repair shows in detail the limits of the zone where the hole was drilled for implantation and where the new bone has been rebuilt. This, I assume, occurs when there is repair after the treatment of alveolitis, but in order for there to be attachment to the tooth there must also be healthy, clean cementum upon the root. But this comes under another head, a feature I expect to present in a paper to be given at this meeting.

Dr. J. S. Marshall, Columbus: Coming to this city of yours directly from the Philippine islands has knocked me out completely. Nothing would have brought me here today but the hope that I might meet some of my old friends, for I really don't feel equal to talking at all. I feel, however, that I am to be congratulated upon being present at this time, because of this Symposium which you have prepared upon the Anatomy and Pathology of the Gums. I have been in a measure isolated for the last three years from the people of my profession. Perhaps it is hardly just to say that, because we have some good dentists in Manila, but they have nothing in the way of a society. When I first went there I made it my business to call upon every white member of the profession, who was reputable, and I am sorry to say when I asked them if they had a dental society they replied in the negative. I was very sorry for this, for I had hoped we could get together occasionally and keep our minds fresh on the new things that were happening in the profession at home. So I have been cut off from the benefits that accrue in society work.

I have had more enjoyment this afternoon in listening to these papers, and particularly to Dr. Hartzell's paper on the Pathology of the Gums and their Sockets than anything that has occurred in the last three years; and I would be glad if I were in a condition this afternoon to speak upon this subject. I am particularly interested in the pathological side of the diseases of the gums and their sockets. I have done some studying along the line of pyorrhea, as we generally call it, or alveolitis. I have had many opportunities to see diseases that don't come in a general practice in the United States. The pathologic conditions of the mouth, even among our own soldiers, are very different from what we find at home, owing to the changes of climate, of environment, and of food. We have some diseases of the mucous membrane you never see here at all. I never saw a case, until I went to the Philippines, of the disease that is known as Sprew. It attacks the alimentary canal, beginning in the mouth and going through the entire tract. We find this disease associated with an excessively sore mouth, so sore that the use of the tooth brush is impossible. There are times when this mouth symptom will pass away and you think your patient cured so far as the mouth symptoms are concerned, but the gastric and intestinal conditions are still there, and the mouth symptoms return again and again. A complete change of climate is the only treatment that is of any real value as a curative measure.

I feel that I have been sitting at the feet of Gamaliel this afternoon and listening to good things. I have heard things this afternoon that have set me thinking and which will stay by me, and I shall hope by and by to continue some of the experiments I have heard detailed this afternoon.

Dr. Hartzell (Closing): Regarding some of the points that have been raised, particularly by Dr. Fletcher, I would like to talk of the pathology of end arteries. The idea I meant to convey was this, namely, that when anything of an irritating nature is floating in the blood stream like uremia or poisons that have a direct selective action upon the tissues contiguous to the teeth, we have a pathological condition known as "cloudy swelling." The capillary lining cells block off the circulation from that area, and if that blocking continues the canaliculi increase and the tissues slough off. That is the point I wanted to make clear, and Nature immediately attempts to re-establish circulation and that immediately tears down more bone and results in further loss of bone. That is the way the picture presents itself to me under the microscope. I may be making deductions that you would not make, and as Dr. Fletcher says, that is a fault that has to be worked out, and perhaps the ideas I am advocating here may be tomorrow controverted and entirely disproved, but that is the way this minute pathology appeals to me, and I believe at the present time it is a true explanation.

The facts that have been brought out by Dr. Price seem to travel along the same line that seem to verify the same ideas I have tried to present, and perhaps in the course and fulness of time this pathology may be worked out and crystallized, and so it may be useful to us all. In the meantime let us give the right hand of fellowship to every man who is willing to spend any of his extra energies along these lines.

I thank you very, very much for the courtesy you have accorded me and particularly the toleration of my friends who were to discuss a paper which I did not write. I hope you will think of me as a fellow worker along the same line you are traveling, and when you get anything along this line that bears on this topic and that will help us all you will bring it out in type or in the society, where it will become our mutual property.

INSTRUMENTATION AND MEDICATION OF GUMS AND SOCKETS.*

By N. S. Hoff, D. D. S., Ann Arbor, Mich.

AT THE request of your Program Committee I shall endeavor to present the subject of surgical and therapeutic treatment on the general theme of diseases affecting the supporting tissue about the roots of the teeth in the varying stages of progress from mere gingival irritation to the ultimate loss of all supporting structures. This is quite a large undertaking, and I hope you are not expecting me to discuss with much detail the necessarily varied technical and medicinal treatments that have been from time to time advocated. I shall endeavor to confine my presentation to such methods as have proved valuable in my hands, and with only so much detail as shall seem advisable to make my presentation clear and intelligible.

In the first place I would offer you a classification of the various stages of this disease, in order that I may make my references more clearly when discussing the application of remedies. I have found much satisfaction in the adoption of the following classification and name for the sequence of conditions which develop in this disease and which I have taken from the several stages of like diseases in other parts of the body. Such, for instance, as Stomatitis with its three stages qualified for pathologic and therapeutic distinctions as inflammatory, ulcerative, and suppurative.

For lack of a better name and to avoid endless discussion I have selected Peridentitis as a most significant and comprehensive term for the class of diseases which affect the tissues about the roots of the teeth. To indicate the different stages and peculiarities of the general disease I have adopted the following qualifying terms: First, Edematous Peridentitis, to indicate an inflamed, swollen and irritable condition of the gums and involving the peridental membrane and in some cases the alveolar process. Second, Hypertrophic Peridentitis, to include a more chronic and less irritable form in which the underlying structures seem to be more or less involved. Third, Suppurative Peridentitis, a condition in which there is constant dissolution of the gum, alveolus and peridental tissues. Fourth, Gangrenous Peridentitis, a condition in which there is a recession of the gums and peridental tissues without pus or any apparent provocation in the way of mechanical irritants.

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*Read before the Ohio State Dental Society, December, 1910.

If you will keep this classification in your minds while I present my method of treatment for each division, I believe we shall arrive at a basis for discriminating treatment. Most writers contend that what we have been pleased to term Pyorrhea Alveolaris, seldom exists in the mouths of children or youths, and is always a degenerative and old age disease, but we have all seen in the mouths of young people the usual manifestations of typical pyorrhea. I have noted a case as young as fourteen years. We have hesitated to name it pyorrhea or to treat it as such because it was not a normal condition in our present nomenclature. I am, therefore, convinced that we need a new nomenclature or at least a more discriminating classification. You may not approve of the one that I have adopted, but since it serves my purpose better than any other that I know anything about, I am going to ask you to show me a better one, or at least help me to perfect this one, by your able discussion and criticism.

Without discussing in detail the histo-pathology of these classified conditions, I will briefly describe the more evident symptoms and outline a typical treatment for each class with representative remedies only, to save time and tiresome repetitions.

Edematous Peridentitis—As the name indicates, this is a sub-acute inflammatory condition, localized in the gingival margins, or gum festoons, and pericemental membrane, resulting in a softening and loosening of their attachments to the roots of the teeth. The gum margins are congested and exceedingly painful when touched, and they bleed quite freely and do not subside to the normal condition when depleted, indicating involvement of the sub-mucous structures. The character of the swelling may be compared with that which affects the joints of the fingers in rheumatism, except that there is more redness. This condition should be clearly differentiated from the ordinary inflammation of the gum margins caused by deposits of salivary calculus in well defined masses, and which is readily healed by the scaling of the teeth. In this condition the gum festoons fill the embrasures and project onto the crowns. It will be found that a probe can be passed into the pocket alongside of the root to an abnormal depth, showing a distinct separation of the pericemental membrane from its root attachment. It will also be found that there is little or no calcic deposit. The socket is usually filled with a watery fluid, but rarely any pus. The root, on close examination, is found to be slightly roughened because of a deposit on its surface of fine granules of calcular material imbedded in a slimy mucoid deposit embracing the entire circumference of the root, extending to the bottom of the pocket. This stage of the disease is found in both young and old persons and is usually present in convalescents from prolonged febrile diseases, and in catarrhal and rheumatic or gouty conditions of the system, especially of the inflammatory type.

The treatment of this class is usually simple and the results satisfactory, but occasionally tedious and difficult. This is especially true where there are bad systemic conditions which retard the local treatment. Because of the irritable gum conditions, instrumentation is painful and thoroughness at this time is impracticable except by the use of local anesthetics, which are generally contra-indicated. The injection of cocaine is so painful as to preclude its use and the topical use of it gives no results. Refrigerating anesthetics are also prohibited because they are likely to delay healing and may even cause sloughing in the already debilitated tissues. As no other form of local anesthetic is available, we must resort to a palliative and preparatory treatment, such as will reduce the irritability and render the necessary operation possible with the least probability of disastrous result. Such treatment will be found in remedies which will cause a local stimulation of vaso motor and trophic nerve functions to promote resorption of irritating exudates, and incidentally of any localized infectious bacterium. For this purpose we have found the preparations of Iodine most effective. To secure the best results the pockets should first be sprayed or irrigated with warm solutions of non-irritating alkaline antiseptic solutions such as Dobel's solution, Liquor Antisepticus, or McFaralane's Plasma Nasal solution, with the intention of removing all detritus from the pockets, and to some extent dissolving the mucoid adhesions from the roots, and at the same time sterilizing the pockets. The Iodine preparation may then be applied in the form of the ordinary tincture, or, as I prefer, in a combination composed of the following ingredients:

℞ Phenol, parts I.
Aconite, parts II.
Iodine, parts III.
Glycerine, parts IV.

This may be applied with a flexible platinum of German silver broach wound with cotton so that it can be passed to the bottom of the cavity without pain or injury to the gum tissue. A pledget of cotton in the pliers should be saturated with the lotion and liberally wiped over the gum where the treatment has been made. The patient may then be dismissed for a couple of days and be instructed to use a non-irritant and astringent mouth wash, one containing zinc chloride, three or four times a day, or a teaspoonful of Tincture of Myrrh in a half tumbler of warm water. By including as much as may be comfortably held in the mouth for a few minutes, and then passing the finger into the mouth and massaging the gums with as much force only as not to cause pain or injury, the astringent action of the remedy will be materially increased. Any other astringent remedy that will accomplish the same purpose may be used. Some prefer the Chloride of Zinc preparations. The patient may also be given a bottle of the Iodine preparation and a small brush and be instructed to paint the gums twice each day if there is danger of infection. If the roots are sensitive the patient may be instructed to hold a warm solution of bi-carbonate of soda or magnesium hydrate in the mouth for a few minutes before retiring at night.

At the first treatment after this the gums should be less congested and not so irritable, and the instrumental treatment can be begun. The purpose of the surgical treatment should be to remove all deposits from the roots of the teeth and make smooth all denuded surfaces. Every practitioner will have his own methods and instruments for accomplishing this. The deposits are usually so insidious that they are likely to be overlooked unless absolute thoroughness is the habit of the operator. Delicate, sharp, and well adapted instruments guided by a most skillful sense of touch and a thorough knowledge of the root conformations are essential to the perfect accomplishment of this part of the work. After the instrumentation the root surfaces must be carefully polished by means of wood points carrying a suitable abrasive. I find orange wood or bamboo points small enough to freely enter the pockets without injuring the soft tissues, and held in a port polisher, most effective. The abrasive is fine pumice mixed with phenol-sodique. After the roots are thoroughly polished all traces of the pumice should be removed with sprays or irrigation. We have to remember in this work as much as in any other that there is a limit to the amount of work that the patient can endure and it is seldom that the entire mouth can be treated at a single sitting. Whatever is undertaken, however, should be completed so far as the surgical work especially is concerned. After the operated field has been thoroughly cleansed it should be bathed with the iodine lotion. These tissues are usually too sensitive for strong zinc lotions. The patient should be given instructions as to keeping the teeth and mouth free from possible infection during the healing of the wounds. This is best accomplished while the tissues are tender by the use of mild antiseptic mouth washes, such as Liquor Antisepticus, or Cinnamon water, or Myrrh water. As soon as permissible the patient shou'd be instructed in the art of brushing the teeth and gums properly, as nothing will do so much to promote consolidation of the gum tissues as regular massaging with the tooth brush. The selection of the proper instruments for the patient's use should be a matter of some thought, as the same brush and powder will not answer for all patients, nor will it for the same patient all the time. The patient should be seen two or three times each week at first to see that all treatment that is needed has been given and that he is doing his part of the work faithfully.

The systemic treatment in these cases may be important at times, and, in my judgment, should be taken care of by the family physician, who should always be made acquainted with the work we are doing and the object we have in view.

Hypertrophic Peridentitis—This condition differs from the one just described largely in the fact that there is little irritability and no hyperemic swelling, although the gum margins are much thickened and encroach upon the tooth crowns and also fill in the tooth embrasures. A separation of the gum from the root is also noticeable, but the tissues are not so plastic, having a tough or fibrous characteristic. Associated with this condition there is always more calcular deposit, sometimes of a soft character, but usually of the hard and granular variety. The alveolar margins are usually absorbed to an irregular and blunt form. This class is seldom seen in young patients, but frequently in patients from thirty years and onward. It is not associated with febrile complaints, and is often found in the robust and healthy, except that it is often seen in patients who live indoors a great part of the time and work hard and worry much. Generally there is no infection apparent and no pus discharge, but in some cases there is a thin pus with a disagreeable odor.

The etiology is not clear to me. Whether the hypertrophied condition is central and nervous or of purely local irritation, I cannot say, but from the fact that it will yield to local treatment I am inclined to think that it has a local origin. It is possible that the irritation of the deposits may produce sufficient reflex stimulation to cause the local development; this also seems possible because the limits of the affected tissue is never clearly defined. The pockets about the roots are not deep except in cases of long standing, and they are sometimes very difficult of access, because of their sinuosity, the fibrous character of the gum margins and the hard deposits.

The treatment of this division is immediately surgical. The scaling process is many times difficult and tedious, as the deposits are firmly attached, and when removed the root surfaces are rough and abraded. Scalers that will comminute the deposit, such as the Kirk push scaler or the Smith files, will serve to break up the hard deposits, and these should be followed by such as will plane and smooth the surfaces to a condition for polishing. The Darby-Perry, and the Tompkins scalers are useful where the deposits are of the softer variety of calculus, but the Carr Root Planers are the most effective instruments for this purpose, particularly when the deposits are deep and firmly attached and have penetrated the root bifurcations and other inaccessible places. If the alveolar margins have been much eroded and have become carious or necrotic the Fletcher and Younger curettes can be used advantageously together with the engine bur in trimming necrotic margins and scaling narrow fissures between roots.

All instrumentation should be followed by thorough polishing of the roots as indicated in the treatment of the first class. If much curetting has been done all loose fragments should be carefully washed out and an application made of some bone and tissue solvent to chemically cleanse the wound and to promote the healing process. For this purpose we have used successfully a fifty per cent. solution of Lactic Acid, or full strength Aromatic Sulfuric Acid, or Dr. Head's Biflouride of Ammonium. The lactic and sulfuric acids may be applied on a small rope of cotton carried down into the bottom of the socket and allowed to remain there two or three minutes. The biflouride of ammonium should be applied with a small non-corrodible drop syringe with which a drop or two of the remedy can readily be placed in the bottom of the pocket. To remove fine granules or membrane from the roots I use these remedies on the wood polishing points very effectively.

The after treatment is one of active stimulation to trophic reactions. Absorption of the hypertrophied tissues is the aim, and preparations containing zinc chloride or other stimulating astringents are useful. The patient should be put on a suitable mouth toilet regime and massaging of the gums at regular intervals, brushing the teeth and gums with a tooth powder that contains stimulating drugs, such as phenol, capsicum, cloves, cinnamon, or pyrethrum and other such drugs. The occasional application of the iodine lotion to the sockets will induce the reformation of healthy tissue and prevent possible reinfection. The sockets should be sprayed every day for a week or so and less often thereafter, with some of the mild alkaline antiseptic solutions to prevent the collection of mucoid deposits and to prevent the formation of centers of carious infection until the gum shall have closed in about the roots for protection.

Suppurative Peridentitis—This is the most destructive form of this disease and the one giving us the most concern in treatment. It corresponds with what we are accustomed to name Pyorrhea Alveolaris. As its name implies, it is infectious and has always a local origin, although systemic discrasia may furnish predisposing causes, and also hinder the progress of treatment. In its various stages of progress it might well be sub-classified for more accurate description and the more intelligent application of treatment. As this would make our paper too long, we will try to give the main points in its differential treatment.

Its incipient stages are usually associated with mechanical irritation from the encroachment of calcular and mucoid deposits on the teeth at the gum margins, producing a lesion and focal point of infection. This irritation generally results in a simple inflammatory condition which always yields readily after removal of the irritant and simple antiseptic treatment. If, however, the tissues afford favorable conditions for the spread of the disease because of low vital resistance, an active pyemia may develop; as a rule, however, the entire mouth is seldom involved except in the later stages of the disease. We very often find a single tooth badly affected and its immediate associates healthy. This fact has led many to believe that the disease is entirely a local infection and never contagious. If, as some have supposed, the disease were caused by a specific micro-organism, the associated tissues would certainly become affected from contact, which seldom seems to be the case, except when the disease is of long standing and much neglect of the ordinary mouth toilet is evident. This fact has also led us to discredit most of the theories of autoinfection, or its classification as a manifestation of a systemic disease.

although much clinical evidence would seem to indicate both its hereditary and idiopathic origin. This point in etiology is not to be settled by theorizing and discussion, and though it is most interesting and its solution would give us new information of great value in the logical treatment, it will require time and much patient work to reach any definite conclusion. For the purpose of this paper we can give only the results of successful treatment, viewed as a purely local infection.

The usual and active symptoms are liberal deposits of calculus either of the soft or hard varieties. When soft, there is generally a limited pus discharge as the deposit has formed rapidly, and consequently little time for the suppurative processes has occurred. When the deposits are of the hard and serumal variety, time has permitted the development of chronic suppurative conditions and a constant discharge is the prominent symptom. The statement often made that there is "*a flow of pus*" is hardly justified, as the process is never active enough to produce any considerable amount of pus. In reality the pus merely accumulates in the pockets and being expressed by pressure or otherwise there is an apparent flow. There may be cases where a mixed and severe acute infection exists where there is a considerable quantity of pus present, but in most cases this can be accounted for by the presence of considerable quantities of extraneous fermentable materials and the pus formation will soon subside upon their removal; but the main affection will not so readily subside because it is more securely entrenched. But whatever the cause or the extent of the infection we believe it may properly be classified under this heading and treated accordingly. Should it extend to extensive suppurative necrosis, it will be amenable to the same treatment modified only to take care of the additional symptoms and conditions. There undoubtedly is present always some form of microbic contamination, usually of a mixed variety, and therefore more easily sterilizable, which in most cases accounts for the ready response to disinfectant treatment. We sometimes encounter specific and other forms of ulcerative infection, which complicate treatment and delay the expected results, but such conditions should not be confused with suppurative peridentitis as we are attempting to define it, and which represents the larger number of these cases which come to us for treatment.

Treatment—The treatment of this form of peridentitis under the limitations of the above definition resolves itself naturally into that of surgical disinfection, followed by such antiseptic and reparative remedies as the individual case seems to require.

The surgical treatment first demanded is removal of all deposits and necrotic tissue as would contaminate the root surfaces and hinder resolution, leaving the root surfaces and environment entirely free from all irritating complications. The instrumentation for this class is similar to that described for the edematous class. The pockets are usually deeper and there is a greater accumulation of offensive deposits, which are more firmly attached and difficult to remove, and the alveolar margins are considerably necrosed, requiring the use of a larger variety of well adapted instruments. Effective work is possible with a few well designed scalers and prophylaxis files, but in many cases the involved root surfaces are quite inaccessible with the ordinary scalers without great mutilation of the gum tissues, which in every case should be preserved if possible to promote good healing and prevent excessive absorption. For deep and inaccessible pockets there are on the market a number of valuable instruments that will materially accelerate operations and at the same time inflict the minimum amount of mutilation and pain to the patient, which is a matter of much concern, as the use of anesthetics in such work is limited to topical applications, because endermic injections prevent prompt healing of the gums.

For local anesthesia the most effective remedies will be found in solutions of cocain. The dilute aqueous solutions are somewhat transitory in action because of their slow absorption; they are to be preferred because chemical solutions cause more irritation and so prevent quick healing. Dr. J. D. Patterson recommends a solution of cocain in chloroform with essential oils and menthol. This is an effective remedy, but the irritant reaction of such pungent drugs will delay the healing. We have found that warm normal saline solutions, or Liquor Antisepticus frequently applied with a syringe during the sealing operation, will keep the field clear and greatly mitigate the pain, making delicate instrumentation possible and securing prompter healing. Alveolar injection may be employed in those cases where the pain is so great as to make effective work impracticable, although great care is necessary to prevent infection or uncomfortable edema. In difficult cases we should, however, not hesitate to employ even hazardous methods where results may not be expected otherwise. We have sometimes resorted to the use of Nitrous Oxide for a particularly painful operation that could not be made without it. We are expected to reach results, and, where at all possible, with as little pain and discomfort to the patient as possible.

The scaling and curetting of the entire field should be most radical and thorough; at the same time it should be accomplished in such manner as will conserve all the soft structures and supporting hard structures that can be brought to a condition of usefulness and function. It is not always necessary that all tissues that have been affected should be removed; to some extent disinfection by chemical reagents which will not devitalize is practicable, and a recuperated tissue is much better than none at all. We should, however, carry the surgical disinfection always to the extent of removing all devitalized tissues. Sometimes this is not an easy matter to determine, but by being careful not to encroach unduly on the living structures, being warned by the pain symptoms, we may usually operate safely. In fact, one of the best reasons for operating without anesthetics is that we may know when we have reached the pain limit and avoid the useless destruction of good tissue.

We have no time here to illustrate or describe in detail all the valuable instruments that will help to make this operation one of endurable pain and at the same time sufficiently radical for successful results. We can possibly have too many instruments for rapid work, but I find that most dentists have so few that can be effectively used, and they are kept in such poor condition that no good results can be hoped for except after great labor and so much pain that the patients will not submit to the operation. A sufficient outfit of well-adapted instruments should be in every dentist's case, and these should be kept sharp and in good order. The form and design should be as simple as possible to avoid a complicated technique and great skill in manipulating them. If one is specializing in this work he will need and be able to use more complicated instruments and need them for the more desperate cases that he will undertake to treat. It is highly important that the instrument handles shall be nicely adjusted to the most sensitive grip of the operator, so that he will be able to make nice discriminations from his sense of touch as to what is being done at all times by the cutting end of the instrument, as most of the work is in the deep pockets and unseen by the operator except through the fingers.

In suppurative peridentitis more of the tissues are involved than in either of the previous classes, consequently the surgical treatment is much more complicated, and for this reason more time, patience, ingenuity and skill are demanded. If the operation is not thoroughly done the result will be problematic, but if radically done there can be little doubt as to the outcome, providing the subsequent treatment is also carefully made. In most cases the subsequent medicinal treatment may be of the most simple character with no disastrous results.

As in the other classes, the polishing of the root surfaces of all the teeth involved is an essential procedure, and without which the surgical operation is never completed. This is accomplished by means of the wood points and abrasives indicated in the other classes, and in addition such chemical detergents as will help to make the scaling complete. Owing to the insidious penetration of infection, we sometimes find it impracticable to follow to the end all the straightened sinuses with instruments without making rather heroic operations. Then we may resort to chemical disinfectants that have penetrating and solvent reactions. For this purpose such drugs as Lactic Acid, and the Bifluoride of Ammonium, suggested by Dr. Head, are very useful. Neither of these agents can be depended upon to dissolve calculus or necrotic bone, but they will force their way into the tortuous sinuses and loosen the attachments so that the calculus may subsequently be removed by delicate instrumentation and irrigation. At the same time these agents become active sterilizers and stimulate recuperative repair. Some care is to be observed in applying these drugs as they are caustic poisons and carelessness in applying them or over-dosing will result disastrously to the adjacent tissues. Where a positive reaction is needed and the conditions will admit of its use, dilute Sulfuric Acid may be advantageously used, but in all cases its use must be carefully guarded and neutralized in a few minutes. The danger in excessive use is destructive inflammation or necrosis.

Following all operations the operated field should be first thoroughly irrigated to remove all debris, and if the operation has been sufficiently thorough, it is better not to use any cauterant or irritating drugs, but the simpler antiseptic solutions will accomplish all sterilization needed, and at the same time leave the soft tissues in condition to heal by first intention. A liberal application of some soothing anodyne to the lacerated gums will be gratefully appreciated by the patient and will help to allay the secondary pain.

If the tissues have been in a chronic necrotic state for a considerable time and the operation has been extensive, a stimulating dressing that has endurance value may be indicated. Such pockets may be packed with iodoform gauze for several days to stimulate the tissues to healthy repair and to prevent reinfection. If no great stimulation is needed, Beck's Bismuth Paste may be injected into the pockets with very gratifying results. The paste is not so good an irritant but has a longer endurance and can be used with considerable freedom, as it is not toxic in any dosage.

Other drugs having these qualities may be used, but we have encountered so much over-medication in the treatment of this disease that we feel like sounding a note of warning against all medication except that which is clearly indicated. We also feel that the profession is being greatly worked by the nostrum vendors. There is no royal road to the treatment of this disease and the sooner we abandon clap trap methods the better success we shall have in stamping out this greatest foe of the teeth.

Owing to the extensive destruction of the alveolus in this class the teeth are many times greatly loosened from their attachments and forced out of occlusion; occasionally forced out of occlusion entirely. After the operation, and sometimes before, all such teeth should be brought into alignment and occlusion and securely anchored to the adjacent teeth by suitable splints. The character of these splints will be indicated by the extent of the malocclusion and the necessity for a brief or more permanent retention. As a rule, as soon as a tooth can be depended upon to retain its normal position in the socket and arch the better it will be for the peridental tissues if it be freed from the restraint of a splint, as it will then receive the normal stimulus from the occluding forces which are very desirable stimulants of the peridental structures. A splint, when needed. is invaluable to give the peridental tissues time to recoup themselves Sometimes it is very desirable to place the splint before doing the scaling, as the pericemental tissues are liable to be excessively irritated by the force used in applying the instruments. In such an emergency a temporary lacing of the teeth together with silk or brass wire ligatures will answer in place of a more durable appliance. If the splint is to be permanently worn it should be designed and constructed with much care, so that it may not be conspicuous, inadequate, or interfere with prophylaxis methods and successful mouth toilet. This subject is one by itself and will require another paper.

Gangrenous Peridentitis—This phase of our classification, while not so prevalent as the third division, is none the less annoying and destructive in its tendencies. In its milder forms it is most frequently observed as a mere recession of the gums. It is not the commonly observed abrasion seen on the canine teeth and caused by an excessive use of the tooth brush and powder, but a shrinking back of the gum festoons in the less exposed situations. It is also unlike the mechanical abrasions in that it encircles the root entirely, involving the entire margin of the peridental membrane. In some cases the teeth suffer most on certain surfaces; for instance, the lower molars are usually more affected on their lingual surfaces than their buccal. The upper molars are similarly affected, but the lower incisors are frequently most affected on their labial surfaces.

The disease seems to start in the gum margin with no apparent symptom of infection or inflammation. Generally there is little or no calcular deposit. It seems to start by a thinning and hardening of the gum margin, which, as the disease progresses, takes on a ragged appearance instead of the chord-like healthy margin. Its progress is not rapid, but a gradual shrinking of the membrane continues whilst the dead membrane seems to adhere most tenaciously to the root surface. A pocket is gradually formed and the adjacent gum takes on a slightly hypertrophied form without much sensitiveness. The alveolar margins gradually melt away without suppuration and no pus appears. After the pocket has attained a considerable depth it seems to secrete a thin, watery exudate, which only occurs after a pocket of considerable depth has been reached. The dry and slow progressing gangrenous degeneration eventually changes to a more rapid melting of the hard as well as the soft tissues and the root loosens in the socket, and because of the forces of mastication the peridental structures take on an acute inflammatory condition, which soon results in the loss of the tooth. In this final stage, if the mouth is not carefully looked after, infection takes place and the condition will change to the suppurative form with copious pus discharges. In fact, all these classes are liable to become blended or changed from bad to worse accordingly as circumstances arise that make for a more or less active form of the disease.

A close examination of teeth from the mouths of those who have suffered from this disease will reveal no considerable deposits of calculus in this class, unless the disease has made very slow progress, or the period during which the serum discharge appeared was much prolonged. The roots in this form will be found covered with a tough fibrous membrane, unless suppuration was present and has dissolved it away, which is exceedingly difficult to remove with instruments alone. It will easily disappear under a rubbing of the root surfaces with the wood points saturated with Dr. Head's tartar solvent, or the lactic acid used in the same way. Robinson's Remedy used similarly has not only a fairly good detergent action, but it also greatly stimulates the repair processes.

In this class the pericemental tissues are not highly sensitive, but frequently the root itself is exceedingly sensitive to the instrument. Where this appears it is a very sure symptom that there is beginning caries, which should be thoroughly planed away and the part polished with phenol sodique and a very fine tooth powder. Several polishings at intervals of two days will entirely eradicate the sensitiveness. If the entire root surfaces are sensitive, thorough and frequent polishing is indicated, with abrasives that will not destroy the tooth tissue too much and at the same time produce a condensation of the surface of the cementum. Sometimes no caries can be detected and still there is a very sensitive spot at the juncture of the enamel and cementum. It will be found that the dead membrane has been worn away at that point and there is evident erosion, probably caused by the acid reaction of the saliva. All such sensitive spots can be removed by polishing with the wood points and bicarbonate of soda, with a tooth powder or whiting as an abrasive. The alveolar process does not melt away so rapidly as in the suppurative form; it seems to stop after the thin margins have been absorbed, or at least it remains to support the overlying gum tissue in almost its normal contour. The gum and bone beneath seem to be in a normal condition of health, while the peridental membrane undergoes degeneration.

The gangrenous type is usually found associated with the nervo-bilious temperament, and in patients past middle life, but I have seen a condition resembling it in the mouth of a young woman not over twenty years of age. It is not usually associated with general ill health, and I have not found it as a mouth expression of a specific disease. I have come to regard it as a condition of mal-nutrition of that particular tissue, because I have found in extracted teeth from such mouths that the pulps were in a process of degeneration. Dr. D. D. Smith thinks it is caused by a condensing or hardening of the cementum, thus cutting off nutrition from that source. This may be true to an extent, but why should not sufficient nutrition come from the living pericementum in the deeper socket? It may be possible that the entire membrane is involved in the degenerative process. We have not made a sufficient investigation of the progress of this complaint in pulpless teeth to have an opinion as to this restraining influence.

Treatment—The surgical treatment consists in the removal of the dead root membrane and what other deposits there may be and the curettement of the alveolus and pericementum down to the live tissues. It will be found tedious and difficult to remove the dead and dried membrane from the roots with the scalers without previously disintegrating it with some chemical solvent, lactic acid, iodized phenol, or the bifluoride of ammonium will materially assist in accomplishing this result. I sometimes find it an advantage to apply these agents a day or two previous to the sitting at which I operate, as I find the instrumentation much easier. All the necrotic membrane with any extraneous deposits should be carefully scraped away and then the root surfaces should be most carefully polished with pumice and phenol sodique applied with the wood points. The polishing is made easier if the chemical solvents have been applied previous to the scaling. If there are no considerable calcic deposits the cleansing and polishing of the roots may be done at one and the same time by using small wood points in the port polisher and saturating them with the chemical solvent and firmly rubbing the root surfaces. It is surprising how readily the membrane will yield to this kind of instrumentation. The root surface is left in the best possible condition after this treatment and no further polishing would be necessary were it not better to neutralize the acids used. This can easily be accomplished by washing the pockets thoroughly with the alkaline antiseptic solution and then rubbing the root surfaces with a solution of bicarbonate of sodium. The pockets should then be thoroughly irrigated and made as dry as possible and a drop of chloride of zinc solution placed in each pocket by means of a wood point or a drop syringe. If the roots are very sensitive, I would use the iodine and aconite solution in place of the chloride of zinc. I have also used the old Robinson Remedy with good results. No further cauterant drugs should be used in the subsequent treatment unless it is found that the healing process is not taking place as fast as it should, because some necrotic remnant has been left in the socket. If the tissues should need stimulation, dilute solutions of the cauterant drugs may be applied at rather frequent intervals until there is good evidence that the healing has begun.

The patient should be supplied with a suitable stimulating mouth wash to be used during the day at proper intervals. Hard brushing of the gums should be avoided for the first two weeks to allow for the chemical disinfection and the beginning of the reformation of healthy tissues. It may then be undertaken with beneficial results. Instruct the patient to brush the gums as well as the teeth. Frequent inspections and repolishing when indicated to keep all root surfaces free from deposits that would delay the healing process and prevent reinfection of the wound.

We have purposely confined our treatment to the strictly local, surgical and medicinal, as it is with this treatment that we have attained whatever of success we have had in the treatment of this disease. The treatment of this disease by wholly constitutional remedies, diet and change of climate, vaccination, raising the opsonian index, or the various electrical, heat and light propositions, does not appeal to me as promising enough encouragement in definite results to warrant the time and expense involved in their application.

So many dentists have become discouraged in their efforts to get satisfactory results in the treatment of this disease that I want to say emphatically that this class of diseases is as amenable to treatment and as large a percentage of cures can be assured as of any other affection of the teeth and jaws. A large reward in satisfaction and appreciation by your afflicted patients awaits any one who will diligently apply himself to the mastery of this treatment.

THE CONSIDERATION OF REFLECTED PAIN IN THE TRI-FACIAL NERVE IN DENTAL DIAGNOSIS*

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ONE of the most important equipments of the intelligent dental practitioner of to-day should be his proficiency in the matter of recognizing and diagnosing those lesions which come under his observation in the routine of his daily labors.

The importance of making a correct diagnosis of the lesions of the oral cavity has not been given the attention or consideration by the profession that it should have in order to accomplish the most positive results.

The object of this paper is to call your attention to the fact that to be proficient in dental diagnosis it is necessary to understand and be familiar with Nature's comprehensive scheme of supplying sensation to those parts that are greatly concerned in the practice of dentistry.

We are taught in biology that the most sensitive nerves in the body are those nerves which guard the bodily orifices. In man the head-end orifice or mouth is almost wholly circumscribed by the tri-facial nerve and its branches. It can then be stated that this nerve is one of the most sensitive nerves in the human body and is consequently subjected to greater nervous disturbances than any other nerve, and there is a greater liability of reflected pain in the vast area supplied by this nerve than in any other part of the human body.

When we consider the field that is supplied with sensation by the tri-facial nerve we can not wonder that it is predisposed to great nervous disturbances, for it is peculiarly exposed to infection and subjected to traumatism.

When the large number of teeth are considered, each having communication with this nerve, together with considerable mucus territory in the Antrum of Highmore and in the oral cavity which are also supplied with sensation by branches of the tri-facial nerve, we can readily see that the dentist comes in contact with more cases of nervous disturbance than any other practitioner of the medical art, because the field in which he labors is wholly surrounded by a net work of nerve fibers more sensitive than any in the whole body.

The sensation commonly known as pain is very difficult to define. It is produced by a stronger stimulus than usual and can only be defined by comparison with other known sensations, such as cold, hunger, thirst, etc. Webster defines pain as an uneasy sensation in animal bodies, of any degree from slight uneasiness to extreme distress or torture proceeding from any derangement of function.

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Reflected pain is the phenomena met with in the human body where the source of irritation or deranged function of the parts may be in one part of the body and the result of the deranged function or the seat of pain may proceed from another region near or quite remote.

The cause of this phenomena is in the light of our present knowledge largely theoretical. Goldscheider, a German scientist, has done a great deal of research work along this line; and in his collected works he concludes that reflected or referred pain is caused by two nerve fibers leading from the same nerve cell, thus, when the source of irritation is in one part of the body and the seat of pain is in another part, possibly remote from the source of irritation, Goldscheider's theory is that the impulse of pain is conveyed to a nerve cell with two nerve fibers leading from it and that the brain may interpret the seat of pain at the nerve endings of either nerve fibre; thus the nerve endings of one fiber may be quite remote from the other as in the case of the tri-facial nerve, one fiber may be in the ophthalmic division of the nerve and the other may be in the maxillary or mandibular division, the nerve cell lying in the Gasserian ganglion and the source of irritation may be in one of these divisions and the seat of pain in another.

Another theory is that a nerve fiber leading from the nerve cell may become split and run as split fibers to different parts of the body. In support of this theory certain nerve trunks have been cut and the fibers actually counted; then cut at a lower level and counted again and the number of fibers are said to differ in the two sections. In case the source of irritation is in one part of the tri-facial nerve and the seat of pain is in another, by accepting this theory we would infer that one part of the split fiber may run in one division and the other part in one of the other divisions of this nerve, resulting in this nervous disturbance, by the sensation affecting two parts remote from each other being conveyed into this same nerve cell and the brain being unable to correctly interpret the seat of pain.

Another very plausible theory is that the nerve cells and fibers in the Gasserian ganglion are so closely intermingled that the afferent impulse may affect the cells whose fibers are supplying other parts with sensation resulting in error of judgment on the part of the patient because of the switching of a message to the wrong receiving center.

Eckley believes that pain follows nerve continuity just as blood follows continuity of blood vessels, and may be considered an intangible and imponderable projectile. As a projectile it follows first, the line of greatest traction; second, the point of least resistance. In support of this theory, if the resistance is low in a portion of the body supplied by one division of the tri-facial nerve, for example in an upper tooth, an irritation in either of the other divisions of this nerve may cause the seat of pain to be in the parts of low resistance.

In cases of reflected pain the sympathetic system may and probably does play an important part, for the reflected irritation returning by a false route superinduces reflex vaso motor changes, and the anaemia or congestion thus produced, causes pain.

While the cause of this phenomenon must still remain largely theoretical, the fact must not be overlooked that it is a nervous disturbance that must play an important part in the correct diagnosis of many dental lesions, for reflected pain most certainly exists and a complete diagnosis can not be made in many cases without its being taken into consideration and relief can not be accomplished until the source of irritation is definitely located.

In order to understand the part that reflected pain may play in dental diagnosis, the parts involved and the connection between the source of irritation and the distribution of pain, it is necessary to review briefly the anatomy of the tri-facial nerve and its communications with other cranial nerves and with the sympathetic system.

The fifth or tri-facial nerve consists of two parts, a large sensory root and a small motor root. As the anatomy of the motor root is not germane to this paper the sensory root only will be considered. From its superficial origin it passes forwards and downwards and spreads out into a flattened somewhat plexiform bundle and enters the Gasserian ganglion.

From the antero external border of the ganglion three large bundles of nerve fibers arise. The first or ophthalmic division enters the orbit through the sphenoidal fissure. The second or maxillary division leaves the skull through the foramen rotundum. The third division passes through the foramen ovals in front of the motor root of the fifth nerve, with which it unites to form the mandibular division. Thus we see that the first and second divisions are entirely sensory, while the third division is formed by the entire motor root of the fifth nerve and a large bundle of fibers derived from the sensory root traversing the Gasserian ganglion. The Gasserian ganglion receives communication from the carotid plexus of the sympathetic and furnishes minute twigs to the dura mater.

The ophthalmic division of the tri-facial nerve gives off three branches, the lachrymal, frontal and nasal, and through these branches supplies with sensation the eyeball, ciliary muscle, iris, lachrymal gland, nasal and ocular mucous membrane, skin of the eyebrow, forehead, nose and ciliary ganglion.

The ciliary ganglion is a composite structure about the size of a pin head. It is placed between the optic nerve and the external rectus muscle about one centimeter in front of the sphenoidal fissure.

Following the general rule applying to the sporadic ganglia which are connected with the fifth or tri-facial nerve, the ciliary ganglion has three roots. A motor or short root is derived from the branch of the oculomotor or third cranial nerve, a sensory or long root from the nasal nerve of the ophthalmic division of the fifth, and a sympathetic from the cavernous plexus. Each of these branches has a definite physiological function. The function of the ciliary branches derived from the nasal nerve element or sensory portion of the ganglion is to confer trophicity and ordinary sensation on the eyeball. The second division of the fifth nerve is intermediate in size between the mandibular division and ophthalmic divisions. This nerve begins in the Gasserian ganglion and ends in the face around the infra-orbital foramen. It gives off the following branches:

A recurrent branch to the dura mater.

The orbital or temporomalar branch which supplies sensation to the superficial anterior temporal region and a small area of skin over the prominence of the cheek.

The posterior dental nerves, usually ten in number, contribute branches to the mucous membrane of the cheek and gums and supply the three molar teeth and the mucous membrane of the Antrum of Highmore.

The middle dental nerves supply the bicuspid teeth.

The anterior dental nerves supply the nasal fossa, the incisors and cuspid teeth and gums.

The infra orbital branches to the nose, lips and eyelids.

Two spheno palatine branches to Meckel's ganglion.

This ganglion is situated in the spheno maxillary fossa. It also has three roots; first, sensory, derived from the superior maxillary division of the fifth nerve through the spheno palatine nerves; second, motor from the seventh nerve; third, sympathetic from the carotid plexus through the great deep petrosal.

The parts supplied with sensation from the sensory portion of Meckel's ganglion are, periosteum of the orbit, gums, mucous membrane of the soft palate, mucous membrane of the upper part of the pharynx, upper and back part of the nasal septum and the anterior half of the hard palate. The third or mandibular division is composed of motor and sensory fibers, and is the largest of the three divisions.

The sensory branches of these divisions are:

The sensory portion of the long buccal nerve, which supplies the mucous membrane lining the cheek with its terminal twigs reaching as far forward as the angle of the mouth. The auriculo temporal nerve supplies sensation to the temporo mandibular joint, the parotid gland, external auditory meatus and the skin of the upper and anterior part of the pinna.

The inferior dental nerve which supplies with sensation the lower teeth through the dental branches, the gums through the gingival branches and the skin of the chin through the mental branches. The lingual branch supplies the anterior two-thirds of the tongue with sensation, the sublingual gland, the mucous membrane and gives communicating branches to the hypoglossal nerve, the submaxillary ganglion and inferior dental nerve.

There are two ganglion on the mandibular division of the fifth nerve; the submaxillary whose sensory portion supplies with sensation the mucous membrane of the floor of the mouth. The otic ganglion contain both sensory and motor fibers and are associated with the nerve to the internal ptergoid. It can readily be seen that the area supplied with sensation by the tri-facial nerve is extensive and the scheme for supplying these parts is a comprehensive one.

An irritation in any of the nerve endings of the tri-facial nerve may cause a nervous disturbance that will be reflected to any area supplied by this nerve or its branches. As an example an irritation in the nasal mucous membrane supplied by the nasal branch of the ophthalmic division may be reflected to the posterior dental branch of the maxillary division and the resultant pain may be in an upper molar tooth, or the irritation may be in a lower bicuspid tooth and the seat of pain reflected through the inferior dental branches of the mandibular division of the fifth nerve to an area supplied by one of the other divisions and the seat of pain may occur in the forehead or Antrum of Highmore or upper tooth or in any region supplied by this nerve and its branches.

To illustrate the difficulty of diagnosing cases involving reflected pain a few cases from the writer's own practice will be cited.

Mr. F. presented with pain in an upper first bicuspid tooth whose root was supplied with a porcelain crown. Every indication pointed to periostitis or to the formation of gas in the root canals. However, the tooth in question would not respond to percussion but would to thermal changes. The trouble was finally located in the lower third molar on the same side as the bicuspid, it having a putrescent pulp. This tooth was treated and at once the trouble subsided. There was no evidence at any time that there was anything abnormal in the lower third molar.

Mrs. H. presented after completion of dental operations involving several weeks with pain in a right upper first molar. This molar had a large inlay involving about one-half of the tooth. Root canals had been thoroughly filled several years previous. No symptoms that any other tooth was involved and the condition responded to thermal changes as well as to percussion. The inlay was removed and canals found in perfect condition. By isolating and testing each tooth above and below a lower first bicuspid was found with putrescent pulp which had previously not been suspected. The application of ice on the lower bicuspid immediately relieved the pain in upper molar. The bicuspid was treated and pain subsided.

Miss L. presented with pain in normal upper cuspid. No teeth could be found that were suspected of trouble, counter irritants were applied to region of supposed trouble without effect. In about twenty-four hours it developed that the patient was suffering from a para tonsilar abscess, which was treated and relief immediately followed. This pain was reflected or referred from an area supplied by the lingual nerve, a branch of the mandibular division to an area supplied by the anterior dental branch of the maxillary division of the tri-facial nerve.

Many cases are on record similar to those just cited, and also where pain in the teeth was caused from injury to the orbit or to the ear and scalp, showing conclusively that the source of irritation is not always present at the seat of pain.

The practical lesson to be derived from all this is that the dentist must be on his guard against a number of sources of error in diagnosis and treatment, and that these cases demand of the dentist a most thorough knowledge of the anatomy of the field in which he labors. The consideration of this phenomena shows how subtlely and how frequently a slight derangement of nervous function produces the most unexpected consequences in the most unexpected places.

What, then, is necessary before completing a diagnosis? A methodical anatomical examination should be made for the source of irritation.

In doing so examine all the teeth, gums and alveolar process on painful side.

Examine Antrum of Highmore on painful side.

Examine teeth, gums, and alveolar process of opposite jaw.

Examine mucous membrane of lips, the buccal mucous membrane and anterior two-thirds of the tongue.

Examine temporo mandibular articulation, the drum of the ear and auditory canal.

Examine supra orbital region, infra orbital region and the mental region; also examine the hard and soft palate.

To sum it all up, examine every area where there is a nerve ending of any branches of the tri-facial nerve for a possible source of irritation.

What of the responsibility of the dentist? Quoting from Eckley: "The tacit understanding between the dentist and the patient aside from the pecuniary and restorative consideration, is the minimal amount of pain on the part of the patient.

"There are certain anatomical and physiological factors that limit a dentist's responsibility in painful operation on the mouth: first, extent of sensory area irritated; second, length of time sensory area is exposed to irritation. These two elements figure conspicuously in the production of pain, and the operator has it in his power to produce the maximal or minimal amount of pain on his patient in proportion to his observance of these precepts. The dentist who carelessly manipulates the lips, who roughly retracts the angle of the mouth, who adjusts the rubber dam so as to involve, by painful compression, gum tissues, and who leaves the patient in the chair for three hours when half that time is sufficient to complete the operation, is culpable because he violates, first, the time element; second, the painful area element concerned in the production of pain."

These things should always be taken into consideration in performing a dental operation, and if we would devote more time to the study of anatomy and physiology of the tri-facial nerve and the phenomena of reflected or referred pain in connection thereto we would be better diagnosticians and be more able to reduce to a minimum the amount of pain attending a dental operation, and in so doing would receive the benediction of our patients to repay us for the efforts.

DISCUSSION.

R. R. Gillis, Hammond, Indiana: Dr. Lyons has presented us with an excellent paper and has covered the subject so well that to discuss it means repetition or else going a little outside the main subject to find something to talk about.

In the early paragraphs he said his object is to call attention to the fact that proficiency in dental diagnosis means a thorough understanding of Nature's complex nerve supply to the parts with which we, as dentists, are working. I might add also that we must understand the close relation anatomically of the other organs which Nature has placed in close proximity to the oral cavity.

When we open the subject of ''reflex disturbances of the trigeminal nerve'' we talk of something that concerns not only the dentist, but also the specialists who treat the eye, ear, nose and throat. We are treading upon what has been called ''neutral ground'' by several writers, for although the dentist probably comes into most frequent contact with the parts supplied by the fifth nerve, yet the practitioners of half a dozen specialties also have terminal fibers of this wonderfully widespread nerve to deal with. No other nerve, excepting the pneumogastric, has such a widespread distribution.

The relations of the fifth nerve to the other cranial nerves is so close that we may expect to find reflex disturbances in the areas supplied by these other nerves, the exciting cause of which may be found in the oral cavity. The sensory portion of the fifth nerve is supposed by Gray to be the lost sensory fibers of the third, fourth, sixth, seventh and eighth cranial nerves. The superficial source of the fifth nerve covers the area of source of all these other nerves combined.

Dr. Garretson makes this statement: ''A diseased tooth may express itself in any part of the body, while on the other hand, disease in any part of the body may express itself in discomfort in a tooth.''

Considering a statement like this from an authority like Dr. Garretson, we can not but be impressed with the magnitude of the subject we have undertaken to discuss. In fact, it is too comprehensive for me to hope to cover any large part of it, and I propose only to call your attention to a few points which we find in our current literature.

All really good dentists (and of course that means everybody here) are able to recognize a reflex disturbance of dental origin in the mouth itself, but I wonder how many can trust their judgment when the seat of pain is elsewhere, in the ear, nose, throat, shoulder, eye, or head, or when the seat of pain is in the oral cavity and the exciting cause outside the mouth, in one of the parts just named.

Dr. Upson, of Cleveland, in the *Cosmos* of May, 1910, goes a long step farther than any other writer on this subject, and makes the claim that dental lesions may be the cause of insanity. That lesions of the abdominal viscera may produce insanity is an accepted fact, and that lesions of the oral cavity might produce the same result does not require any great stretch of the imagination. Dr. Upson reports that of fifty-eight cases of nervous and mental diseases examined by means of the skiagraph, thirty-two showed imperfect teeth. Many of these cases gave no history of dental pain, and in not one was pain confined to the region of the impaction. Out of these thirty-two cases, nine were operated upon dentally, six have recovered, two are improved and only one, which was of long standing, remains unimproved.

His observations, covering several years' time and a great number of cases in several hospitals and sanitaria, demonstrate clearly that the field which we as dentists call our own, may be responsible for grave disturbances of which we heretofore have not been cognizant.

Dana, in his text on Nervous Disease, says: "Reflex irritations are distinctively exciting causes, but with few exceptions they can not cause a nervous disease, unless there is a predisposition to it." However, it is reasonable to suppose that an irritation of a nerve, when continued long enough, would eventually sap the vitality, deplete the parts, and lead to such serious consequences as Dr. Upson describes. The peculiar feature of his claim is that the conditions developed with the patient entirely unaware of any serious dental lesion. He characterizes it as "painless dental disease."

In consideration of his article, it is a great wonder to me, when I see some mouths, that more of the human race are not fit candidates for "Longcliffe."

In *Cosmos*, June, 1908, an article by Dr. Alleman, of New York, makes a plea for closer relation between oculists and dentists, because their field of labor is so closely related in the nerve supply of the parts. His paper, he says, means "Don't be a specialist." It is a good idea.

For the practical side, so far as actually doing our work is concerned, we must be specialists, but in diagnosis we surely must be something more than tooth carpenters. We must have accurate knowledge that will enable us to recognize human ills outside our own field of endeavor; knowing the oral reflex of such lesions and conversely the outer reflex or oral lesions.

Then may we be considered real dentists and expect to demand a just recompense for being such.

Dr. C. D. Lucas, Indianapolis: I think this paper by Dr. Lyons is one of the most timely which has been presented before the association this year.

I am associated in college work with students of the Freshman class who are studying this work which Dr. Lyons has gone over, the dental anatomy of the trifacial nerve.

I am sorry it is the case, but the students advise me they have been coached by the dentists who are their preceptors that they are going to receive too much theoretical teaching in college and not enough practical dentistry. I think it is time all dentists who refer students to the college should refrain from telling them that didactic work has no bearing on practical dentistry.

Dr. Lyons shows how important it is for the dentist to understand dental anatomy. Each and every one of you who have extracted lower third molars have seen reflex pain from these operations. Suppose a patient should come into the office of a young dentist who had just started into practice, and this young dentist should extract a lower third molar, and in two or three days the patient should return and say to him, "I have a very severe pain in the region of my ear since you extracted my tooth. What is the cause of this pain?" Does not the patient have a right to expect a logical answer? If we should not teach our students theory they would not be able to explain the cause of the reflected pain. This is one instance where didactic teaching, such as we do in the college, has to do with establishing the integrity of the student with his clientele.

If this question were put and the young dentist could not explain the cause, he would possibly advise the patient to visit an ear specialist. On the other hand, if he would explain definitely to the patient in terms that he could understand, it establishes this young dentist more firmly with his patient.

I never have heard a paper by Dr. Lyons which was not timely and very definitely instructive. He is teaching this work at the University of Michigan and is doing a great amount of oral surgery. That is one reason he has devoted his time to this subject tonight, and I am sure he has illustrated the point which he wished to emphasize. Therefore, when you refer a student to the college, never give him the impression that he is going to get too much theory. The more theory he gets the more it develops his mind. The more you develop the student's mind the better he will be able to take care of his practice, because he will be better able to inform his patients as to the cause for various conditions met with.

I am glad Dr. Lyons brought this paper before the association, and I enjoyed his paper very much. I am sorry we are not to hear from Dr. Buckley nor Dr. Tileston, for this paper should receive liberal discussion. In closing my remarks I will ask other men who are interested along this line to carry the discussion further.

Dr. J. N. Crouse, Chicago, Illinois: There is only one thing I wish to speak of. I have had several patients where adhesion and reflex pain over the face made it very difficult to diagnose. This was true in the case of four teeth that I took out of one mouth. In this case each time I was called in the middle of the night. The man was suffering intensely and I attempted to find a pulp cavity. This case will appear in Buckley's revised book. The diagnosis was exceedingly difficult, the suffering was extreme. In one case he dropped off the chair with the pain. The only indication I could get at all was, by taking a tapping of it I would get a little indication of pulp nodules. I had two other cases where I found this same thing, but they were nothing like this one. I lost track of the patient because he called me each time at night and I didn't have much confidence in his paying his bill. I hunted him up once about his bill and he skipped me, and so I lost track of him. I would like to have kept him.

L. L. Davis, Chicago, Illinois: I did not hear all of Dr. Lyons' paper, so cannot discuss it judiciously, but there is one thing I wish to say about the Indiana State Dental Society. I did not have the privilege of seeing a copy of your program before coming here, but during the last twenty-four hours it has been impressed upon me very strongly that the subjects which you have chosen for discussion seem to fit into each other in such a way that no better post-graduate course is offered by any college that I know of at the present time. These papers seem to fit intimately one into the other. The paper by Dr. Grieves last night, the paper this morning by Dr. Strain, and the other papers that I have listened to all seem to blend one into the other and speak one message to the society—that is to make yourselves better dentists and better citizens. To the younger element I wish to say if you do not take advantage of every opportunity during college life, then you are going to be very poor dentists when you get out unless you have the good fortune to listen to a series of papers like those that have been presented to this society at this meeting. I wish to congratulate the society upon the quality of the papers and the manner in which they have been arranged by your committee.

On the subject under general discussion I shall not speak.

L. E. Custer, Dayton, Ohio: I had not expected anything like this. I think Ohio has been sufficiently well heard from that it will not be necessary on my part to add anything.

The paper, however, brings out a valuable point, and that is the very great importance of diagnosing. And there is no part so perplexing probably as that which Dr. Crouse has referred to, that is the presence of pulp nodules, which are so hard to diagnose. I feel that if there is one thing more than another which has been of benefit to us in the meeting, it is the paper which we have heard this evening, which will aid us and place us on a higher plane with our patients and also with the medical profession. They refer these cases to us and it is up to us to properly diagnose them. It is the dentists who finally solve the most perplexing thing they have to deal with.

Dr. Keeley, Hamilton, Ohio: I have listened to this paper with a great deal of interest, because I think in the last two or three weeks I have had three or four cases of reflex pain that have been very hard for me to diagnose, and I do not know yet whether I have diagnosed them properly.

One was the case of a lady about forty years of age, in which the location of pain was in the right superior third molar. By diagnosis, probing, etc., I could not find the slightest particle of cause for the sensation there, nor could I find it in any other part of the mouth. I told the lady I thought she simply had a case of neuralgia, put her off for a few days, told her to come back and see if things were not better, in order to give me a little time to think up some other excuse for her.

Another was the case of a man in which the location of the pain was in a left superior bicuspid. I could not find a sign of decay in any of his teeth except in the right third molar. That gave a response to hot and cold water. I saw that case Monday afternoon before I came up here. I gave that tooth a treatment and am waiting until I get home to see if I struck the right cause. This question of reflex pain is one that has given us more cause for trouble than anything else. We find it in numerous cases and it is something that is very hard to tell where it comes from.

HARRY C. CARR, Indianapolis, Indiana: I would like to describe a case that came to my hands eight or ten years ago, in which a girl of eighteen suffered agony from reflex pain in practically every tooth in her head, to the extent that every metal filling was removed, nerves devitalized, the root canals filled, the fillings replaced by gutta percha and cement, and still the reflex pain continued.

I resorted to the use of the X-ray, which showed the impacting of the upper third molars. Those teeth were removed and the reflex pain was relieved. This case probably continued over a period of three months before I realized that the X-ray was an adjunct to the examination.

P. G. PUTERBAUGH, Chicago, Illinois: We have heard the term neuralgia referred to pain, and reflex pain. Neuralgia is a pain along the course of the nerve, and a referred pain is produced by some irritation along that nerve. A reflex pain is very similarly defined.

I would like to bring out the matter of the reflex pains of pregnancy. You must always look for those, because they take place through the sympathetic system. You know there are parts of the sympathetic ganglia that run along the spinal column, and these fibers carry the impulses to the fifth nerve. The fifth nerve is the one nerve in which we have neuralgia above all other nerves of the body due to pregnancy.

The other point is in reference to the sinuses of the face. Very often you will have cases that will have all of these symptoms of the pain. Another case that shows what the skiagraph will do. A student of the Rush Medical College had been having pain over one side of his face for six months. He was becoming addicted to the use of morphine to relieve his pain. He had had his eyes and ears examined and his teeth gone over a number of times, but could find nothing. He had a crown on two lower molar teeth on the left side. I removed one of these crowns and they both seemed to be well made. I had a skiagraph made. There was no odor there. The man's pain was relieved and he said it was the first time he had had relief in four months. The root had been devitalized sevnn years before, but when the devitalizing agent had been carried through was very hard to say.

DR. EDWARD C. MILLS, Columbus, Ohio: Dr. Lyons invited me this afternoon to discuss his paper, but not having had an opportunity to read it or review the anatomy of the region referred to, it is with some apology that I comment on the excellent paper the essayist has presented.

Dr. Lyons has given a good presentation of the intimate relation of the fifth pair of nerves to the sympathetic nerves, through the ophthalmic portions of this system, namely the ophthalmic, spheno-palatine, otic and submaxillary ganglia. The branches of communication and of distribution of these ganglia we are supposed, or were once supposed, to know, but after a few years of practice our knowledge of anatomy becomes somewhat hazy.

At these ganglia the nerves often receive branches from other cranial nerves, and, excepting the optic, olfactory and auditory nerves, none of the cranial are free of fibers derived from other trunks—this makes it difficult to say from where nerves to a special part have come; the difficulty of diagnosing and locating the seat of trouble is increased owing to the fact that the pain does not always reside in the affected part. The irritation has caused some change, which, transmitted along the nerve trunks, has excited a condition in the nerve centers accompanied by a sensation; for this reason we may find it necessary to examine the entire field of distribution of the three divisions of the fifth pair of nerves for a lesion, which through the sympathetic may be producing a reflex pain in the ear or elsewhere about the head.

Dr. Lyons, in his paper, emphasizes the importance of examining the upper and lower teeth of the affected side. It is not an uncommon occurrence to find the teeth of the affected side in perfect condition and the seat of the trouble on the opposite side; for this reason we should be circumspect in our examinations or we will fail in our diagnosis.

Your worthy president, Dr. Lucas, stated the importance of impressing upon the mind of the college graduates the causes of the reflex pain we meet in practice, so as to enable them to explain why we may have pain in some distant part due to a dental lesion. These men are supposed to be taught sufficient anatomy during their college course to explain these reflexes to the laity, if necessary; if they are not taught while they are in college they will seldom, if ever, apply themselves sufficiently to acquire this knowledge after they are out.

The members of our profession, as a rule, devote little time to study along these lines, and for this reason their instruction should be sufficiently grounded, though the details of anatomy may escape their memory, a general knowledge should remain that will enable them to give an intelligent explanation of these conditions referred to by Dr. Lyons. The success of the dental educational campaign now sweeping the country depends upon us individually, and personally I feel this paper should stimulate us to study, that we may keep abreast with the instructed laity.

Dr. Lucas: Mr. Mills didn't understand me at all. I said that the dentists who are sending students to the college to receive instruction should not discourage the students in the theoretical instruction which they are to receive, but to encourage them in it.

Dr. Lyons (closing): First I wish to thank you for the kind manner in which you have received my feeble efforts this evening.

There are just two or three points that I care to refer to in closing the discussion.

In discussing the paper the terms reflex pain and reflected pain are used synonymously. This is one point I wish to make clear. We get the reflex pain only as a reflex act through the sympathetic system by the contraction or dilation of the vascular walls. Pain may become so intense that a reflex action is set up through the sympathetic system and that the seat of pain may be transferred by these vaso motor changes to remote parts.

We may also get the reflected pain from some physiological phenomena in the nervous system itself, which at the present time our knowledge of the subject does not reveal, so that I must take exception to the point Dr. Mills brought out that all reflected pain comes through the sympathetic system. We only get the reflected pain from this system in the manner of a reflex act.

In this connection I would suggest that the case which Dr. Thompson speaks of is one where the vaso motor changes have played an important part. The intense pain produced in the removal of the spur caused a reflex act superinducing vaso motor changes, no doubt congestion of the anterior dental branches of the superior maxillary division of the fifth nerve, which later caused the pulp to die in the central incisors.

I am very glad indeed to hear Dr. Lucas bring out the point that the dentist should devote more attention to the physiological and anatomical nature of the field in which he labors. To be able to make a thorough and positive diagnosis of many cases of obscure pain which the dentist daily comes in contact with he must be able to trace the pain from its seat to the source of irritation, and he can only do this by being familiar with Nature's scheme of supplying sensation to the head.

Inflammation should be located positively or eliminated entirely in every case. The skiagraph should be resorted to when necessary, and in many cases it aids materially in diagnosis.

One of the hardest cases to handle is those cases of neurasthenics, that is cases of imaginary pain. I have a patient in my practice who has had no less than seven or eight operations made by various oral surgeons of this country for the relief of pain. Always better after the operation, but in a short time the pain returns. Every operation has been resorted to for her relief. I have watched her for three or four years and I am thoroughly convinced that her pains are all imaginary. I simply mention this that we may be on our guard against this class of patients, and if we thoroughly understand the nature and causes of reflected pain we will be better able to guard against operating for this class of cases. They are few, I am glad to say, but nevertheless they exist and will be found in the average practice.

I wish again to express to you my deep appreciation for the courtesy extended to me this evening.

INSURANCE FOR DENTISTS.

By S. D. Ruggles, D. D. S., Portsmouth, Ohio.

"THERE is no decivilizing agency like want. It soon destroys the innocence of children, the chastity of women, the honesty, loyalty and self-respect of men."—Hon. Judson Harmon.

Were our lease upon life a given quantity, instead of an absolutely unknown and intangible one, there would be less need for the great insurance companies. So multitudinous are the agencies that affect mortal's existence on this mundane sphere, that good health and longevity of forebears are of slight consequence. While the grim reaper claims many men in the activities of early manhood, more reach middle life before illness or calamity reminds them of their own insecurity and the helplessness of those dependent upon them. The few years of usefulness then remaining are inadequate to make the preparation which should have been under way many years before.

We are living in an age when the young man is in the lead. He is sought to the exclusion of men of maturer years and judgment. Man's period of usefulness is short and well defined; the opportunity then passes to the younger man. It particularly behooves the dentist to recognize this fact. Unlike the physician or lawyer, the last decade of his life is apt to be less remunerative than the preceding. The man entering the dental profession at twenty-five lives, on an average, sixty-five years.

In order that conditions existing late in life may be appreciated, the writer quotes from a letter received from one of the actuaries of a large eastern insurance company:

> "Of all men living at age of forty-five, eighty per cent. are prosperous, contented, more or less successful in business, are laying up money, and are therefore independent. Take these same men twenty years later, age sixty-five, and this is what we find: 50% dead; of those living but 3% are independent or self-sustaining. In other words ninety-seven out of every hundred at age 65 are partially or wholly dependent on relatives, friends or the public for their daily subsistence."

The above statement, coming from such an authority, is sufficient to warrant very serious consideration, especially when a family is to be reared and educated. Dentists, as a class, are not considered good business men for reasons already known; but the interest shown recently by some of our journals in devoting whole issues to subjects dealing with the business side of dentistry is sure to impress itself on a large number of readers.

Since the Armstrong investigation in 1907, life insurance has been placed on a firmer and higher plane than ever before. It has been stripped of its speculative features and is no longer considered a lottery. The present law for the State of New York is what might be termed the standard which governs the sale of insurance in America, and is explicit and rigid in its requirements. No old line company has ever been known to fail in this country; and by an old line company is meant one not of the co-operative or fraternal order.

The question naturally arises, what per cent. of an income should be invested in life insurance? The income itself and the number of dependents are the chief factors to be considered in determining the amount and kind of insurance bought. Usually insurance is not intended for one's self, but for those who would suffer in case of insurant's death. Originally, the law compelled the insurance to be made payable to the wife only.

It is estimated that the income of the dentist will average about two thousand dollars, the income of those in small cities and towns exceeding many times the city practitioner's on account of lessened expense. Economists have set twenty per cent. of one's income as the amount to be conserved, and one-half of this amount should be used to purchase insurance. In many cases a much larger amount should be consumed. The oft-recurring argument that a savings account yields a better result in the end is best met by the answer that it is too accessible, and lacks the compulsory payment feature necessitated by an insurance premium. Beginning with the Ordinary Life Policy the kinds of insurance as they are developed from this basic principle will be discussed. The first is simply an agreement to pay a stipulated amount yearly until death, and this for the average man is the best policy. The present tendency among business men is to buy the greatest protection for the least money. Life insurance is not, even in its most attractive forms, bought as an investment. It is protection that is sought, not investment. In this form of policy, which is scientific and mathematically correct, you simply pay your proportion toward a fund which will return to every individual member at his death exactly the amount called for on the face of his policy. This cost is based on the figures of the American Table of Mortality. In event the family is no longer in need of this protection, or the business is past its doubtful period, these policies can often be surrendered for paid-up insurance almost equal to the amount paid in. This is not true of the old forms of ordinary life policies, however. In all probability the reader wonders if there is a dividend in the ordinary life policy and why insurance is not an investment if dividends are returned by the company.

Just here the use of the term Annual Dividend should be explained: The yearly premium on a policy is divided into two parts. One represents the exact amount which must be invested yearly, at say three per cent., for a period of years, to yield a sum equal to the face of the policy; the other represents the cost of conducting the business, plus a loading to cover any unusual expense or loss whatsoever. The American Mortality Table is the accepted guide in this work, but to be doubly secure a slight excess is levied for the sake of safety. The dividend, then, is what the company returns to you after all expenses are paid, and represents the excess or overcharge. This applies to straight life contracts the same as other forms.

The Twenty Payment Life contract is perhaps the most popular form of policy written. As just stated, the Ordinary Life is the basis for all the other forms and is modified to suit the individual desires of the purchaser. By paying a larger annual premium for twenty years the full amount is accumulated sooner, and your obligation ceases. The same is accomplished in ten or fifteen years as the insurant may elect. To many men, this form is especially attractive, as it comes during a man's most productive period, and relieves one of obligations as old age comes on. True, the amount of protection is no greater than in the straight life contract, and from a purely business standpoint may not be the best one to buy. However, there is a great satisfaction in knowing that at a definite time your obligation is at an end.

Unfortunately, in many instances, these policies have a loan and cash surrender value after a few payments are made. Nearly all policies written since the Armstrong investigation have a clause stating that should you default entirely after these payments have been made the policy will automatically remain in force for a certain period stated in the contract. The Massachusetts law required this stipulation many years prior to the investigation in 1907.

The old form of deferred dividend policy, that is one where the supposed earnings are distributed at the end of twenty years or end of contract, is no longer legal and consequently can not be written.

An Endowment Policy is a combination of straight life or level premium insurance, with what is called an investment feature combined. However, if you die before expiration of contract you lose your investment payments. Terms are ten, twenty or thirty years, according to desires of purchaser. This form of policy is written less than any of the other forms mentioned and is due largely to two causes. The premium is about double that of a straight life and decreases the protection a man should carry by 100%. Or in other words, he could carry twice as much straight life with double the amount of protection in case of death for the same premium. Secondly, the policy must be paid when the time is up and the insurance discontinued. This occurs just when insurance is needed most, and in order to carry insurance it must be taken out at an advanced age and a much higher rate. The claims made that any incentive for a young man to save money is a good one, may be all right, but how much better it would be to take out the other level premium form of policy and double your protection and in the end really have a semi-endowment. Endowment policies must be outlived in order to realize the benefits. Should death occur before the twenty years you lose the benefits for which the extra high premium was paid, while a level premium policy costing half the money would yield the same result. Do not try to make a savings bank out of an insurance company. Buy your insurance from them and put your difference in the cost of the two forms in something else. If death should overtake you it is not forfeited. In New York State no company is allowed to write participating and non-participating insurance. That is, you are entitled to the surplus or dividend of the participating form, or it states explicitly that you do not share in it, and collect the face only of policy. The rate is always higher on this form and nothing is gained.

Term Insurance is the cheapest form of insurance written and is used by business men to cover risks or some indebtedness for a short period of years. The shorter the time of contract the less the cost. It is well adapted for its purpose and should be used more than it is, but not by dentists except under conditions just mentioned.

The Continuous Installment Policy is one of the newer forms. Usually when the insurant dies the proceeds of a policy must be invested to produce an income in lieu of salary or practice. As a rule the widow is without business experience and necessarily looks to friends for advice. It sometimes happens that advisors, though sincere, make mistakes and buy stocks or other paper and the principal is lost. This contract is written to insure an income to the widow without any effort or handling of funds on her part. The premiums are paid in usual way for a stated period or until the death of the insurant, and then the company pays monthly to the beneficiary or executor a sum specified in contract for twenty years or longer, should the widow survive. In some respects this resembles the pension paid soldiers' widows by our government. In no way is the principal apt to be lost from bad judgment or mismanagement and the plan is commendable.

"A continuous installment policy providing an income of $100.00 per month, or $1,200.00 per year, will cost on the ordinary life plan, assuming the insurant is 35 and the beneficiary 30, approximately $480.00 per year. This policy would provide an income of $100 per month for a guaranteed period of twenty years, and as much longer as the beneficiary may live. Twenty years will be sufficient to see the youngest child self-supporting, and the income is certain for that time. If the beneficiary is still living at the end of twenty years she will continue to receive the income during her remaining life-time."

FRATERNAL INSURANCE

The tendency in our land is to belong to some kind of an order, secret or otherwise. These, in many cases, have an insurance department for the mutual benefit of their members. The assessments which are collected quarterly take the place of the old line company's premium, and vary according to the number of deaths during the period involved. In the early years of these associations, the rate or assessment is especially low, owing to the fact that the membership is composed chiefly of young men. As time goes on these assessments increase, and when old age arrives they are so large that the insurant is often compelled to drop out entirely, if indeed the association has not suspended in the meantime. Such is the history of many such institutions.

"The enlightened leaders of these orders have recently united with the Insurance Commissioners in the preparation of a tentative uniform bill for enactment in the various states, providing for a readjustment of fraternal insurance on a scientific basis. This will come about in a decade or sooner and will necessarily involve a very large increase in rates.

"It will, however, be far better for the members of these orders themselves, for the safety and certainty are more important in life insurance than the question of cost."

At the present time these associations are selling insurance at about one-third the cost of old line companies. If you wish to speculate on a short term policy for any particular purpose you are reasonably safe, and when it is dropped, your protection has been bought below actual cost.

ACCIDENT INSURANCE

There is no class of men more dependent upon their senses for a livelihood than the dentist, yet I am informed that physicians carry accident insurance to a greater extent. The most trivial mishap may incapacitate one for his work and you must realize that your income stops that very instant. Can you recall any other line of work more difficult to delegate to another or perform under a handicap? In this day of rapid transit and the automobile, the wonder is that more are not injured instead of the few that are. Twenty per cent. of the claims for accident insurance by dentists are due to infection. Seldom do we have a patient when this risk is not taken, and in some cases a very serious one. It is estimated that thirteen per cent. of our patients are victims of syphilis in some form. While this may not be included in an accident policy it well helps to impress the gravity of the puncture of an instrument. No one dependent upon a practice should be without sufficient insurance to pay at least half his usual income. This can be done, too, without great expense. The many accident associations, patterned after the Commercial Travelers taking what are termed perferred risks, give very low rates.

This is one phase of assessment insurance which is to be commended, and their rate is not subject to the same fluctuations as the one above mentioned. For a yearly premium of ten dollars a $5,000.00 policy can be carried, with a weekly indemnity of twenty-five dollars, in case of disability. The commercial agencies make good reports upon these associations and it is my belief that they are serving a good purpose.

The writer, in preparing for this article, sent out a series of questions to many of the leading insurance companies of America. Most of them replied in a very courteous and interesting way, which is hereby acknowledged.

A FINISHING TOUCH IN DENTAL BRIDGES*

By W. J. Akeroyd, D.D.S., Dresden, Ohio

The object of this clinic is to show an easy but effective way in which the ordinary soldered-facing bridgework may be made more esthetic as well as hygienic.

It pertains to filling those spaces between the facings, also between facings and crowns, with gold foil or with the crystal gold, such as Keeton & Williams, Moss Fiber, etc.

After the bridge is finished and polished in the usual manner, these spaces are gone over and plugged with the gold foil, using thin pluggers such as D.P., S.S.W. pluggers Nos. 31 and 32. For burnishing the finished filling burnisher No. 34 (S.S.W.) is very handy.

The filling is further finished as follows: Fasten one end of a string, holding other end in hand, after applying moistened pumice pull the bridge back and forth over the cord, thereby obtaining a high polish.

Summary: Bridge is easier to keep clean, therefore more hygienic.

The 24k gold will not tarnish like the solder, therefore more esthetic.

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*Clinic at Ohio State Dental Society.

SOME ETHICAL CONSIDERATIONS OF THE DENTAL BUSINESS.*

By Richard Summa, St. Louis, Mo.

THE peculiar relationship of a profession's code of ethics with the profession, and to the public in general, is not generally understood more than that there exist certain rules of conduct governing the actions of the practitioner toward his patient and his fellow practitioner and patients. The larger field of ethics or ethical conduct is less often thought of because in general business ethical conduct is usually unknown and not desired. Our religions do not always make the distinction between ethical or altruistic rules of conduct and spiritual conceptions and Biblical mandates—injunctions. Theoretically ethical, or right rules of conduct, should be universal in all business relations, but we cannot ignore the fact that conditions are otherwise. Society, through its various organized governments, has recognized the necessity and the existence of different and more ethical rules of conduct in the professions embraced in the healing art than in general commercial business by granting those professions certain legal benefits and exceptions for the good of the whole.

The fundamental principle of our ethical code, and the principle that is tacitly or otherwise recognized by governments whereby we obtain our legal status and protection, is that we shall in all instances, in giving service or advice, give that service or advice that is for the best benefit to the patient regardless of whether it is most profitable or least profitable to the practitioner. This we are legally and morally bound to do. In general commerce we take it for granted that a salesman will use his persuasion that we purchase that article which is of most profit to the seller. In professional life, after having given service and advice according to the ethical rules mentioned, we approach the business relation and as business men are entitled to the arrangement for and the collection of a suitable fee. It is natural that men who are ethical in the professional sense will be ethical in their business relations, and we think conditions availing will bear this out. This influence goes even further and extends to our relations with the dental trade, a purely commercial relation, yet we find the dental trade conducted on lines ethically far superior to general commercial transactions. In fact there is much the same ethical advice and service between the supply salesman and the dentist that there is between the dentist and his patient.

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*Read before the St. Louis Society of Dental Science.

The above comments on ethical relationships are written because of recent attempts by Dr. Edmund Noyes in the September 1911 *Dental Review* and by Dr. R. Ottolengui, M.D.S., L.L. D., D.D.S., before the National Dental Association to justify the patent agreement between the old Dental Protective Association and Dr. W. H. Taggart, a dental patentee, to cast aspersion on those who opposed such an agreement. Both Dr. Noyes and Dr. Ottolengui were endeavoring to show that all who oppose such action are violating right rules of conduct.

Dr. Noyes devotes several pages to show that many prominent men whom we revere did just the opposite of the actions he seeks to justify, while the paper of Dr. Ottolengui seeks to show that the dental profession is seeking to rob Dr. Taggart of his legal rights.

Let us review some of the ethical relations in this controversy from the viewpoint of a "square deal."

1. The relation of the dentist to his patient.
2. The relation of the dentist to the profession.
3. The relation of the Dental Protective Association to its members.
4. The relation of the Dental Protective Assn. to the profession.
5. The relation of the Dental Protective Assn. to the patentee.
6. The relation of the patentee to the government.
7. The relation of the patentee to the profession.
8. The relation of the profession to patents in general and in particular.
9. The relation of the profession to Dr. M. F. Finley.
10. The relation of the profession to the new National Dental Protective Association.

While the above division of relationships may not cover every particular of the controversy, they will permit one not conversant with all of the facts to reach a fairly just conclusion as to which side may claim an ethical reason or reasons for their actions. As it would cause considerable reiteration to discuss the several relations enumerated, we will simply leave them as stated above as guides to a better understanding of the following:

The Dental Protective Association was organized and incorporated in 1888 under the laws of Illinois by Dr. J. N. Crouse. It was organized for the assumed purpose of testing the validity of patents for which royalties should be assessed or attempted and was given the support of the public-spirited men of the profession then in practice and gave the profession good service in several years' litigation over a process patent. Dr. Crouse solicited and received the support of the profession in establishing a dental supply house and a journal. It is reasonable to suppose that these institutions were profitable to Dr. Crouse, as he still runs the supply company and only recently gave over the control of the journal. While Dr. Noyes does not mention this reward to Dr. Crouse for his efforts in directing litigation, it is nevertheless true. After some years of comparative quiet in patent litigation we find patents were issued to Dr. W. H. Taggart of Chicago, covering the so-called casting process. Dr. Taggart is a man of the highest personal and professional standing. He has for many years been known as one of the most skillful men in the profession and has enjoyed many years of high-class practice in Chicago, where dental fees are comparatively high. With this introduction to the two characters in the controversy, let us consider the attitude of the profession toward the patents and also the government's position therein. The medical profession has maintained a determined stand against the issuing of patents to the members thereof on penalty of losing professional standing. The dental profession, owing to its large mechanical element and dependence on mechanical appliances, has assumed a different stand. Freed from the technicalities cast into the problem by Dr. Ottolengui the generally accepted attitude is about as follows:

Instruments, appliances, machines and materials are considered patentable, because it is commercially impossible to make and market them without such protection, and it is beyond question for the greatest good to all that such conditions should exist. Some patents have been taken out and given to the profession as a protection against extortion, but in the case of instruments, appliances and machines, this is not good policy, for it makes it difficult or impossible to obtain manufacture. Patents covering a process, as a band around a tooth or a disappearing wax model, a process covering only the manual labor of the dentist and restricting his efforts to give his patients that best service he is morally and legally supposed to do are opposed because of such restriction, although patents upon instruments, machines or material for such procedure are permissible as a just reward to the inventor.

Governments recognize that and give the protection allowed by patents to stimulate the material growth of the nation. Because without the reward that follows the issuing of a successful patent there would be less incentive for improvement.

But let us emphasize this point. Our government is based on a series of checks, one department having an opportunity to put a check on the work of another, and in creating our patent laws it was considered necessary to check possible abuse by making the courts a check on the patent office and on patent claimants and patentees, and as a result of this governmental system of checks a patent is of doubtful commercial value unless its validity has been fully established by court decisions. While it would doubtless be for the best good of the nation if process patents pertaining to the healing art were not permissible, the government does not now make that distinction, but it does by the check system make it possible to defeat some of these patents.

This, then, should be the true function of a protective association, and it was the idea in creating Dr. Crouse's organization. Therefore, in compromising with a patentee of a process patent without litigation and even attempting to cast discredit upon those who have assumed its just burden, ''The Dental Protective Association'' has not fulfilled its right and ethical relation to the profession in the opinion of the essayist.

The relation of the patentee to the government is that it holds certain rights granted him by the government, *but* subject to litigation to establish the validity of the patents so granted.

His relation to the profession is that he has for many years a well-established and presumably lucrative practice and has been given and has used all the improvements and new knowledge given the profession by the men doing research work in its various branches, and who did not attempt to collect royalties for such work. He also had the unquestioned opportunity to reap a full reward by the sale of his machines, appliances and materials. In seeking to test the validity of his patents he also had an opportunity to bring suit against a large number of manufacturers of casting machines. Why did he choose a single practitioner and one outside of the Dental Protective Association and throw upon him the burden of a defense? Was such a course the most ethical or was it simply an effort to find a weak opponent?

Was it ethical and right that the directors of the old Dental Protective Association should establish the precedent of compromising with a process patentee without litigation and without the knowledge and consent of the members of the old Dental Protective Association, who had joined the organization for a different purpose and who had rewarded Dr. Crouse by support and taken stock in his commercial enterprise. Was it ethical and honorable to incorporate into the by-laws such an agreement voting the proxies of members who had received no notice of a meeting for that or any other purpose? Is it ethical and right that the function and aim of the Dental Protective Association, which was built up by several years' labor by hundreds of our prominent men, be perverted because one patentee mismanaged his opportunities? Is it more ethical or right that Dr. G. V. Black should pay a royalty to Dr. Taggart for the disappearing wax model than that Dr. Taggart should use Dr. Black's many years of labor on cavity preparation, study of caries, filling materials, instrument shapes, etc.?

And what, by the way, is the agreement signed by Dr. Crouse and Dr. Taggart? Does anyone except the signers know what the details of this agreement are? Is it an ethical agreement? Is it a right and just agreement? Will the signers bring it to the light of day and let us pass full judgment?

While this controversy has been raging and the famous agreement was being worked up and signed there was a law suit being tried.

Dr. Boynton was sued, even as you or I might have been sued, and it is only reasonable to suppose that Dr. Boynton had begun to cast, as we all did, with the means available. The Taggart machine could not be purchased for a long time, nor could information concerning it be obtained. When Dr. Boynton was sued a *volunteer defense committee was organized* to contest the suit, Dr. Crouse having declined to assist. Contributions were asked and given by a large number of men in all parts of the country and Dr. M. F. Finley, acting as head of the committee, has given his time and his money for several years to this task. While contributions were many the total has not been sufficient for the defense, and so Dr. Finley has not only given his time from his practice but has advanced funds from his private means to continue the gathering of evidence.

Dr. Finley's work has been very strenuous and trying and expensive. He is not establishing a dental supply company nor a dental journal. His work has been purely for the good of the profession as he sees it, and he only asks that the profession furnish the financial support. He has had the antagonism of both Dr. Crouse and Dr. Ottolengui in this work. Has Dr. Finley's work been ethical and for the good of the profession? Few of us can appreciate what it has meant to him in giving up time for consultation with attorneys, correspondence concerning evidence, soliciting funds, etc.; and his reward is—what? Hard work, loss of time from his practice, early discouragement from lack of support, bickering from the highly ethical New York editor and a knowledge that he at least has done his best duty to his profession at a loss.

Is it ethical for the profession to ignore his appeals for support?

The National Dental Protective Association was organized to give Dr. Finley the support he could not otherwise obtain. Its efforts will be to do those things that the original organization is supposed to do, and should do with its large membership and funds, but does not now do.

The National Dental Protective Association asks, on the grounds of ethical and right conduct, that you give it support by your membership.

Can you ethically do less? Can the profession submit to a tax upon its manipulative skill? A process patent royalty is such a tax, no matter who the patentee is. Those who do not favor such a tax should send their membership fee of ten dollars to Dr. M. F. Finley, 1928 "I" street N. W., Washington, D. C., secretary of the National Dental Protective Association.

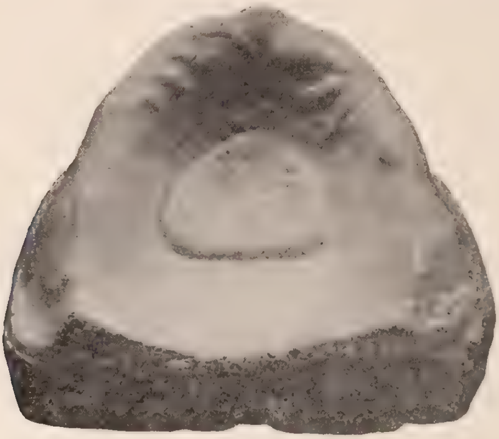
AMERICAN CIRCULATING DENTAL CLINIC

(*Continued from page 731, October Summary*)

THE CAST ALUMINUM PLATE

By Robert Seymour, D.D.S., Philadelphia, Pa.

A PLASTER impression is taken of the case in the usual manner, and if a vacuum chamber or relief is needed it is cut in the impression. This is then given a thin coat of equal parts shallac and sandarach. When thoroughly dry an additional coat of sandarach varnish, when quite dry a model of silex and plaster in the proportion of three of the former and one of the latter is made, always taking the precaution to thoroughly soak the impression in water before running the model. (See cut No. 1.)



No. 1

The silex I use for this purpose is a slightly coarser grade than that used for inlay investment. This will give a harder model and still produce a smooth surface on the casting. The plate is now waxed in the usual way, using tennax wax, as it is thinner than the ordinary base plate.

The following additions will be noted in Cut No. 2:

(a)—Plate spurred or scored.

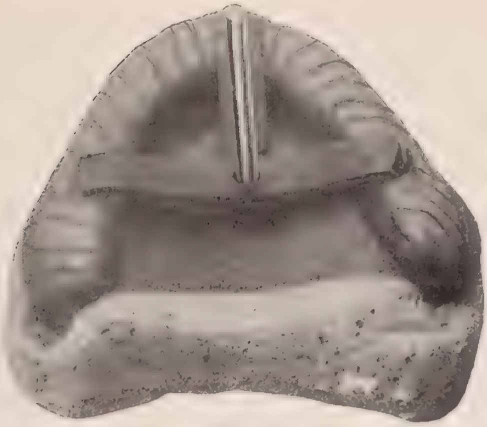
(b)—Wax rim inside and out.

(c)—Gateways.

(d)—Sprue.

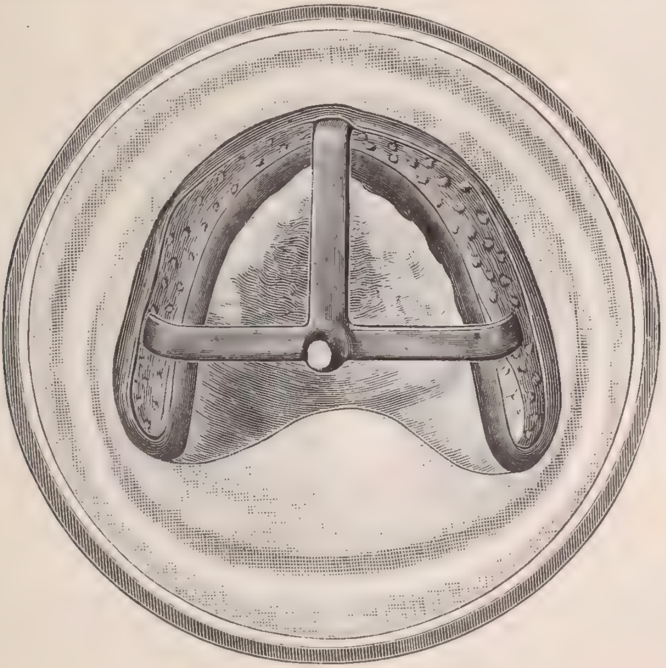
The sprue may be a No. 10 wire as shown in No. 2, but we prefer a short wax sprue as shown in No. 3.

The plate being ready to invest, it is wise to place it in water and allow it to absorb all it will take up. The case is now invested in the lower



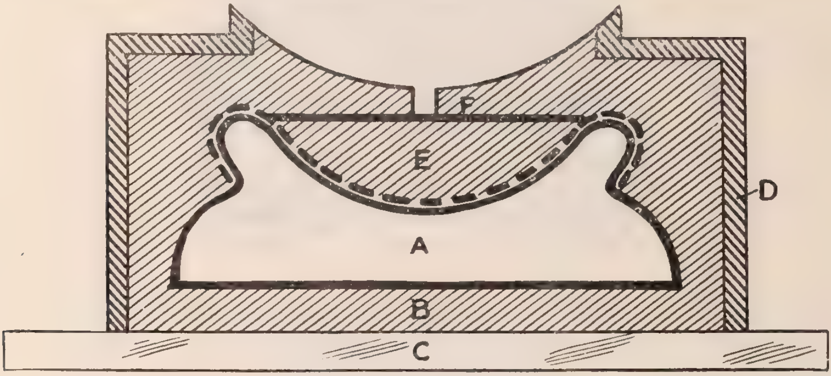
No. 2

half the same as an ordinary rubber case, bringing the investment to the edge of the wax. When this is properly trimmed place a V-shaped groove encircling the model a short distance from the wax. This surface is now given a slight coat with oil and afterwards brush lightly over with powdered soapstone; where the rugae surface has been transferred by means of tin foil, as in the case shown, this tin should also be slightly oiled.

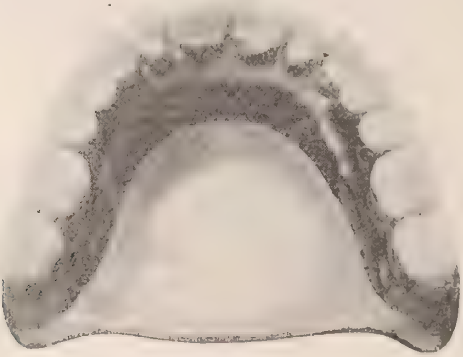


No. 3

The second half of the flask is now placed in position filled with investment, taking the precaution to shake it well to place; while this is still soft, a recess is cut away in the central opening of the flask, until the short wax sprue is exposed; this forms a crucible, for the subsequent melting of the metal. After the investment has become hard the flask is subjected to dry heat for a few moments and separated; the entire base plate of wax is readily removed and the only portion of wax left to be burned out is that contained in the gateways and sprue. The case is now heated on the furnace, and if any carbon is left on the surface of the model it can be readily removed with the blow-pipe, as the entire surface is exposed and has a great advantage over the closed flask method, as it is difficult to burn out such a large quantity of wax, and if this is not done the resulting cast is a failure. This is true in both systems of casting where pressure is placed directly against the molten metal, or the method of creating a vacuum.



No. 4



No. 5

When the case is hot, the upper part of the flask is again placed in position and it will locate itself by means of the V-shaped depression, which was cut in the first half, as the second half of the flask will have its counterpart. It also forms a guard to prevent escape of the metal from the flask.

No. 4 shows a crossed section of case at this stage. The cup is now placed on the base of the machine, and the plunger cap placed firmly against it for the permanent adjustment of the flask. The metal is now heated in the recess prepared for it and when thoroughly melted the casting is made by packing moist asbestos fiber in the plunger cap of the machine and bringing it gently, but firmly, against the flask. When the metal is cold, remove and cut away the gateways, leaving a small portion remaining to help retain the rubber. The teeth are placed by means of the rubber attachment.

The advantages of this method over the swaged plate are as follows:

1. Better adaptation, especially in undercut cases, as the case is cast direct on the original model.

2. It is stronger, as a rim is carried not only on the outside edge of the plate but also on the lingual surface a short distance from the teeth, the plate can also be varied in thickness according to the strain.

3. Better anchorage for the teeth.

CAST GOLD SPLINTS FOR PYORRHEA.

Dr. J. G. Lane, Philadelphia, Pa.

Showing more particularly a method of uniting the two plates of the splint and the technique of making up the uniting medium.

Fig. 1.—Finished splint in position. The two plates fastened together by means of iridio-platinum screws.

Fig. 2.—Pattern for one plate of splint, showing graphite rods in position to core the hole for the screws. In order to get the proper lineup for the cores they are placed in wax pattern before the latter is removed from the model.

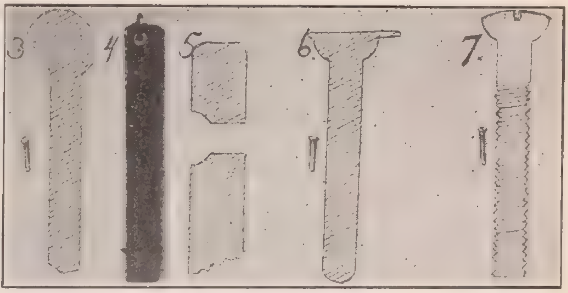


Fig. 3.—Iridio-platinum blank for screw. Surplus material for head obtained by partly fusing the end of the wire.

Fig. 4.—Heading tool. Made by drilling a hole in a piece of steel and counterboring the hole to any sufficient depth with a round bur. This must be tempered.

Fig. 5.—Sketch showing section of Heading Tool. (Note shape and depth of counter-bore.)

Fig. 6.—Screw blank after same has been placed in the Heading Tool and the surplus for head hammered down in counter-bore.

Fig. 7.—Finished screw. Shank threaded, surplus material on head removed with a file and slot cut with ribbon saw.

CAST PINS FOR CROWNS.

W. A. Stewart, D. D. S., Kansas City, Mo.

This pin is to be used when and where a pin is needed in a tooth; for example: a Richmond crown, to help anchor inlays, in broken down teeth, or to be used in the root or roots of molars that are to be built up.

ADVANTAGES

1.—It is tailor-made and fits.

2.—No part of the tooth is taken away that is not filled by the pin.

3.—It tapers, making it the shape of the root, and does not weaken the tooth at farther end of pin, leaving it plenty large enough at the other end.

4.—Never fits until it is in place, leaving plenty of room for cement to be displaced.

5.—The pin is made before the patient comes, and will fit as soon as it is placed in the canal.

6.—Always stays in place while working around it before it is cemented.

7.—Impression is not taken in wax.

DIRECTIONS TO MAKE

Fill the ring with investment and let it dry; drill a hole with reamer in investment, then cast; drill a hole in the tooth with the same reamer, any depth desired; try pin in and see that it fits; if it is too long cut it off. I use 22k gold.

CAST POSTS FOR STEELE'S FACING.

George H. Walker, Los Angeles, Cal.

This is a portion of a gold rib cast. One end is cut and shaped for the anterior teeth and the other for posterior. Wax is forced about the rib when in tooth and shaped to suit. Facing then removed and the wax invested and a casting made as per finished tooth.

A sheet of base-plate wax is placed on a flat surface at the edge, and, beginning with the largest hole, the draw plate is drawn over the edge of wax, gradually cutting wax down to size of smallest hole. Wax is then cut from sheet, forming strips, as per sample—a sprue attached to one end coiled like watch spring, flasked and cast. Wax must be chilled to draw nicely.

It is not the size of the dog in the fight that counts, but the fight in the dog that wins.—A. G. Lewis.

PREPARATION OF POST FOR DETACHABLE POST CROWNS.

J. Q. Byram, Indianapolis, Indiana.

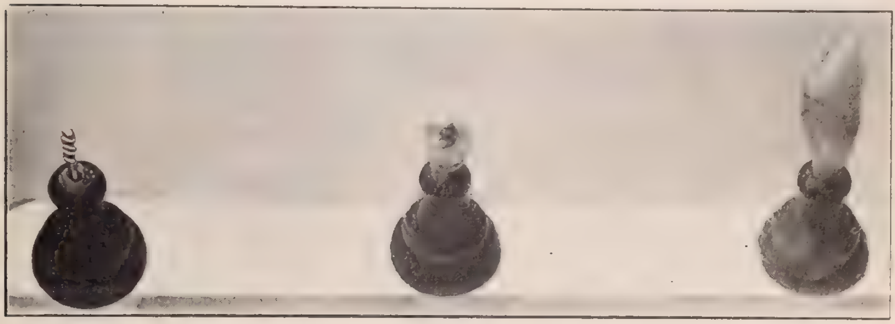


Fig. 1 Fig. 2 Fig. 3

Fig. 1.—Sixteen (16) gauge wire wrapped with thirty (30) gauge wire and soldered to end which fits in crown.

Fig. 2.—Wax coping attached to post.

Fig. 3.—Finished crown.

A SAFE AND HANDY SAFE*

By D. D. Smith, D.D.S., Sandusky, Ohio

There is an old adage that "There should be a place for everything and everything in its place," which we have contracted into *SYSTEM*.

I know of no place where time can be saved, and many times gold scrap and other valuables, better than by keeping them in a safe near at hand. The main reason why there is not more put into safes at night is that safes are not made so that the dentist can put into them the things that he desires.

Take the dimensions of the inside of your safe and see what an amount of things can be put into it and how handy it will be. For instance, start by tearing out the stationary lining of the gold drawer of the laboratory cabinet. Have one made that you can take out at night and lock up. Arrange the remainder of the safe and have your tinner make it the way *YOU* want it.

I find so many say, "Well, I have a small safe and haven't the room to do such things." That is just the kind that I have. The dimensions of my safe are 14x17.5x11 inches, yet there is not any lost space in the 2,695 square inches.

By having this made of tin, using brass screw heads for knobs, the job will be neat and compact. Figure it with your tinner.

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*Given as a clinic at Ohio State Dental Society.

EDITORIAL

AN IMPORTANT SERVICE

MANY dentists seem to think that the repair of diseased teeth, the supplying of artificial substitutes where teeth are lost, and extracting teeth is the fulfilling of the mission of the dentist. Such a view of dentistry is indeed a narrow one. It is no less the dentist's duty to recognize pathological conditions of the soft tissues of the oral cavity and render such service as he can toward their alleviation, especially where the disease is adjacent to the teeth and if untreated may impair their usefulness.

There is one condition especially that dentists in general should recognize and treat and that is diseased gums. Too often inflammation of the gum margins is unheeded and its neglect may lead to serious and disastrous results so far as the teeth are concerned. If the dentist were more careful to detect and treat this inflammatory condition of the gums about the teeth, especially in its incipiency, there would be far less pyorrheal after trouble. Indeed, we have seen many cases of incipient and some of well advanced pyorrhea alveolaris that dentists had either overlooked or refrained to say anything about. Were these men doing their duty to those patients?

When a patient entrusts the care of his teeth to the dentist it is his duty to do everything he can to preserve them, and if any of our readers has not been giving attention to diseased conditions of the gums it is time he did so.

Modern methods of treatment of these diseases, especially inflammatory conditions due to deposits about the teeth, have brought such satisfactory results that every dentist should employ them.

With the improved scaling and pyorrhea instruments it is possible to remove all irritating deposits and restore a healthy condition of the gums. And the instrumentation and treatment requires no greater skill than any dentist should possess.

It is an important service that should be rendered to patients, and dentists generally should see that even slight inflammation of the gums about the teeth is not overlooked. "An ounce of prevention is worth a pound of cure." Here is the opportunity and the opportune time for prevention, and a dentist cannot give his patient better service than to relieve and banish these diseased conditions.

SOCIETY·ANNOUNCEMENTS

OHIO STATE DENTAL SOCIETY

The forty-sixth annual meeting of the Ohio State Dental Society will be held in the Southern hotel, Columbus, December 5, 6 and 7, 1911.

The following program, while not stating the exact titles, indicates the subject matter of the various papers:

Dr. A. O. Ross, Columbus, President, "Most Frequent Causes of Mortality among Dentists Compared with other Professions, with Means of Prevention."

Dr. H. T. Smith and G. T. Fette, Cincinnati, "Potency and Penetration of Dental Medicaments."

Dr. F. W. Gethro, Chicago, "Cavity Preparation for Fillings and Inlays."

Dr. H. Printz, St. Louis, "Modern Methods of Producing Local Anesthesia."

Dr. C. R. Turner, Philadelphia, "Artistic Dental Prosthesis."

Dr. J. K. Douglas, Sandusky, "Cast Gold Inlays vs. Gold Fillings."

Dr. Henry Barnes, Cleveland, "Sweated Gold vs. Cast Gold Inlays."

Dr. L. E. Custer, Dayton, "Porcelain Inlays vs. Silicate Cement Fillings."

The above splendid program of papers, together with the usual large list of clinics, insures something of interest to every member of the profession.

Much more commodious quarters have been procured for the sessions of the Society, insuring ample room for all.

All reputable dentists are cordially invited.

F. R. Chapman, *Sec'y.*

SOUTHWESTERN MICHIGAN DENTAL SOCIETY

As previously announced in these pages, the convention of the Southwestern Dental Society will be held at Grand Rapids, Mich., November 28th and 29th, 1911.

An invitation has been extended to the Third and Fourth District Societies to meet with the Southwestern, which means that this is going to be one of the best meetings ever held in the State.

At this meeting the question of amalgamating the three Societies as one and affiliation with the State Society will be considered.

A splendid program has been arranged and particulars may be had by referring to the full page announcement elsewhere in this issue.

Make your arrangements to attend this meeting. It will be one of the best of the year.

ANNUAL MEETING INSTITUTE OF DENTAL PEDAGOGICS

The next annual meeting of the Institute of Dental Pedagogics will be held in Chicago, January 24th, 25th and 26th, 1912. (Notice change of dates.)

The officers and committeemen have arranged a program that will be of much interest to every dental teacher. In addition to the excellent papers and instructive exhibits one day has been set apart for the inspection of the Chicago schools, where all departments will be in operation.

A detailed program will be given in the next issue of this journal.

INDIANA STATE BOARD OF DENTAL EXAMINERS

The next meeting of the Indiana State Board of Dental Examiners will be held in the Capitol, Indianapolis, beginning Monday, January 8th, 1912, and continuing four days. All applicants for registration in the State will be examined at this time.

No other meeting will be held until June, 1912.

For further information apply to the secretary.

F. R. Henshaw, *Sec'y.*

507-8 Pythian Bldg., Indianapolis, Ind.

STATE BOARD OF REGISTRATION AND EXAMINATION IN DENTISTRY—STATE OF NEW JERSEY

The State Board of Registration and Examination in Dentistry of New Jersey will hold their annual meeting in the State House, Trenton, N. J., December 4th, 5th and 6th, 1911. Candidates for examination are requested to have their applications in the hands of the Secretary ten days prior to the date of meeting. For information apply to the secretary, Charles A. Meeker, D.D.S., 29 Fulton street, Newark, N. J.

PENNSYLVANIA STATE BOARD OF DENTAL EXAMINERS

The next regular meeting of the Pennsylvania State Board of Dental Examiners will be held in Pittsburg and Philadelphia, on December 13, 14, 15 and 16, 1911. For application blanks address Dr. Nathan Shaeffer, Supt. Public Instruction, Harrisburg. Alexander H. Reynolds, Secretary, 4630 Chester avenue, Philadelphia.

G. V. BLACK DENTAL CLUB CLINIC

The G. V. Black Dental Club will hold a mid-winter clinic in St. Paul during February, 1912. Definite dates will be given in next issue of this magazine.

Dr. R. B. Wilson, *Sec'y.*
American National Bank Bldg., St. Paul, Minn.

CANADIAN DENTAL SOCIETY

Union meeting Canadian Dental Society and Ontario Dental Association at Hotel Brant, Hamilton, Ont., June 3, 4, 5 and 6, 1912.

AUSTRIAN SOCIETY OF DENTISTS OF VIENNA

The Austrian Society of Dentists of Vienna will celebrate its 50th anniversary at Vienna on November 14th and 15th, 1911.

SOME PRACTICAL SUGGESTIONS*

By W. F. Wilson, D.D.S., Columbus, Ohio

THE INNER CUSP IN CROWN AND BRIDGE WORK WHEN ONE OR MORE OF THE OPPOSING TEETH ARE IN SUPRA OCCLUSION.

Make abutments in the ordinary manner and procure impression and bite and articulate models. Select facings and grind to position, allowing tips of cusps to touch occlusal plane formed by cusps of the abutment crowns. Back the facings, tipping backing heavily with solder, swage the cusp, trim and place in position against backing and in occlusion with opposing teeth, and solder.

This method permits us to fulfill the esthetic requirements of a posterior bridge, at the same time restoring the entire masticating surface.

REPAIR OF A GOLD CROWN HAVING A BROKEN SURFACE

With the broken, cut or torn crown in position upon the root of the tooth take impression of broken surface with modeling compound, remove impression and crown from the mouth, replace crown in the impression and burnish platinum inlay-foil over the broken surface on the interior surface of the crown, fill crown with investment material and flow solder on the exterior surface of the platinum matrix, uniting the edges of the broken surface. By this means you get an exact reproduction of the missing portion of the crown.

VULCANITE REPAIR: REATTACHING ONE OR MORE TEETH TO DENTURE

Wax the teeth in position upon denture and take an impression, with modeling compound, of teeth to be replaced and one or more teeth adjoining, remove wax, pack with rubber in the ordinary manner, using impression as a matrix to hold teeth in position, remove matrix, flask with one mix of plaster, and vulcanize.

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*Given as a clinic at Ohio State Dental Society.

A SPRAY BOTTLE CONTAINING

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THERE is no other antiseptic available that is comparable to Listerine in those pleasing characteristics of odor and taste which make its use so agreeable to the patient while securing for the practitioner the antiseptic influence that may be required.

An ex-president of the American Dental Association, writing to the manufacturers of Listerine, says: "The more I use Listerine the better I like it. I use it after any surgical operation in the mouth as an antiseptic wash, prescribing Listerine one part, water ten to twenty parts. After nearly all protracted operations in the mouth, I offer as a gargle and mouth-wash twenty to thirty drops of Listerine in half a tumbler of water, and find that it leaves the mouth in a delightfully cool and pleasant condition, and promotes healthy granulation of lacerated or bruised tissue."

THE DENTIST'S PATIENT

A leaflet designed to convey useful information respecting the care of the teeth. Supplies of this interesting treatise on oral hygiene are furnished free of expense to dental practitioners for distribution among their patients. A specimen copy, together with an order-form, will be sent upon request.

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THE DENTAL SUMMARY

The Magazine That Helps

Vol. XXXI DECEMBER, 1911 No. 12

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REGULAR CONTRIBUTIONS

RESTORATION OF BADLY DECAYED AND BROKEN DOWN BICUSPIDS*

By W. H. Moseley, D.D.S., South Boston, Virginia

TO ME a badly decayed and broken-down bicuspid tooth is one of the most difficult and perplexing things that I have to contend with in my practice, especially when it is in the mouth of a young lady with a prominent and well-formed set of teeth. It is here that our skill is required to replace this tooth without marring the appearance and at the same time do a satisfactory operation—one that you are not afraid of and that you know will give years of service. Now, what are we going to do with a case of this kind? It is here that one is strongly tempted to put on an all-gold crown because you know it is the strongest and best thing you can do, but you dare not do it because it is out of the question and your patient will not stand for it.

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*Read before the Virginia State Dental Society, 1911

The next thing that suggests itself to you is a porcelain crown of some kind, and you cut the tooth down and open up the canals and find, very much to your dismay and sorrow, that the tooth has a bifurcated root. Instead of one large, well-formed canal you have too small diverging canals that it is impossible to get a proper size, well adapted post into that will carry the crown. You then commence to wish that you had not cut the tooth down or probably that you had never seen it; but you must do something with it, so you commence and spend probably several hours of hard work over this operation, trying to adapt a crown that is going to stay there and look just as you and your patient would have it look, and I want to tell you that you have no easy task, and I have been kept awake many a time in the last ten years trying to think up some way out of the difficulty.

Without wishing to appear vain or boastful, I wish to say that I believe that I have solved the problem, and I bring the crown before you that it may speak for itself. It is a thing of beauty and a joy forever, and you have only to see it to appreciate it. It is easily and quickly made in the following manner:

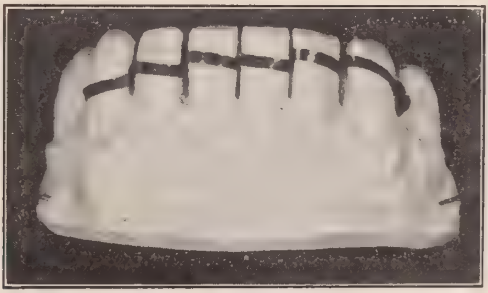
After preparing the root in the usual way to receive an all-gold crown, proceed to make one and fit it over the tooth and to the bite, and then cut it out on the front or labial side, making an open-face crown of it, using a stone to nicely shape the edges, beveling them towards the inner part of the crown. Now take a piece of 22k gold plate slightly larger than the opening and slip under this opening and tack it at the gingival border with a piece of 22k solder about the size of a pin point. This is very important, because if you get too much solder it will flow around where it is not wanted and ruin the piece of work. After doing this, try the crown on the tooth and burnish the gold well to place and see that it is well soldered at every point. Then take a No. 2 engine bur and make four or five holes through the piece of gold to receive the porcelain body. You now have a nice little counter-sunk depression with a perforated bottom on the labial side of the crown which is afterwards filled in with low fusing porcelain. This is done by mixing the body to a creamy consistency and tapping it into the cavity, using water and alcohol half and half to hasten the drying process. After the body has thoroughly dried take the crown in a pair of pliers and throw the flame of a blow-pipe directly on it and fuse the porcelain. It will run like butter and you need not have any fear of burning up the gold crown provided you have used 22k solder and have the piece thoroughly clean and watch the flowing of the porcelain and stop just at the proper time.

You can accomplish this with about three bakes as a general thing, and you can mix your colors during the different bakes to match any shade desired. This will give you a strong and durable piece of work that can be used as an abutment for bridges or wherever you desire to combine esthetic effect with strength and durability, and the beauty of it is that it can be done so quickly and easily.

TEMPORARY RETENTION FOR LOOSE UPPER AND LOWER INCISORS

By J. W. Jungman, D.D.S., Cleveland, O.

Roll out the ordinary Angle orthodontia wire to a ribbon; anneal and gold plate. Start from left to right by forcing the wire down between the bicuspid and cuspid; then lace it, carrying the strands over and under so as to lock them. At the right cuspid, wind one strand around the other, and force it between the cuspid and bicuspid so as not to irritate the lip.



Where there are one or two loose teeth, I usually carry to the adjoining teeth only.

A DEVICE FOR FACILITATING THE PERFECT ADAPTATION OF BACKING AND SOLDERING WITH LEAST POSSIBLE CHANCE OF CHECKING FACINGS.*

By D. A. Rosenthal, D.D.S., Pittsburg, Pa.

The device consists of two wooden instruments (Figures 1 and 2) with depressions for the retention in each of a rubber cork, one more flexible than the other. Placing tooth, pins up, on softer cork (Fig. 2) and pressing backing into its place with other instrument (Fig. 1) will encase tooth in a nest of gold, thereby protecting it all around. Do not bend pins before tips are soldered, i. e., if tips are desired. Run the pins through a piece of rubber dam and insert a flat, V-shaped steel instrument between the pins (Fig. 3). Push instrument forward while pins are being bent with wooden instrument (Fig. 4), this action tending to prevent the direct force against the porcelain, which often causes a fracture before case is even invested.

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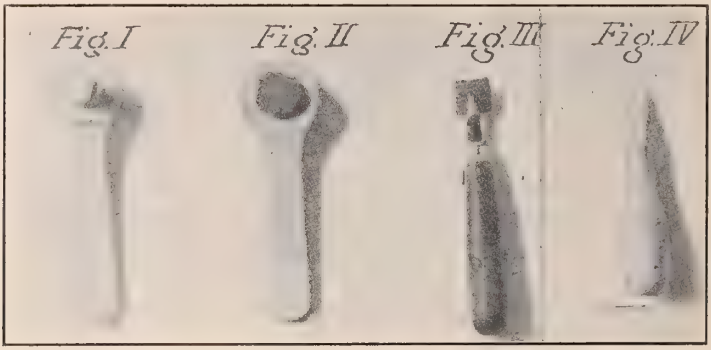
*Clinic at Lake Erie Dental Society, 1911.



As an additional safeguard against checking, I paint the facings before investing with a composition consisting of equal parts of powdered asbestos and prepared chalk and a small quantity of plaster of paris.

THE CEMENT LINE IN INLAYS

By Clarence J. Grieves, D. D. S., Baltimore, Md.

(Continued from page 747, November Summary)

While it is most desirable that the individual operator should have an intimate knowledge of salivary analysis, so intricate is the subject at present it is hardly to be expected that he can apply it to his daily work; the foregoing scheme shows the principal mouth types, and a close observer may, by carefully noting conditions, read the record written on the teeth and gingivus as a geologist reads the rocks and reach a fairly accurate conclusion of existing mouth conditions.

Thus, it will be noted from the foregoing, that caries does not recur in the mouths of erosion at all and rarely in those of pyorrhea in the division classed systemically as Hyper-acid, that for instance, in the erosion types there is a coincident lack of the carbohydrate element and an excess of sulpho cyanates coupled with an absence or rapid solution of mucus, the saliva is acid because of the acid sodium and calcium salts secreted as a content of the mucus, *a systemic acidity.*

On the contrary, in the mouths classed systemically as Hypo-acid, dental caries is rampant; here the carbohydrate element is far in excess, as is the mucus, which is abnormal in quantity and quality, being thick and ropy, with the sulpho-cyanates coincidentally below normal, the saliva is again acid from the decomposition of the carbohydrate element excreted with the mucus; *a general bacterial acidity.* Lying between these extremes, and gradually merging into each, according to the variation in diatheses, is the Normal, where the body processes, and consequently the excreta, through the saliva, are equally balanced, the saliva is alkaline or neutral in reaction, caries occurs, but does not recur except when retention centers are produced for the decomposition of carbohydrate foods, producing areas of *local acidity.*

As all junctures between filling and tooth, and butt and lap-joints are no exception to the rule, bear much the same relation to incipient caries, as do enamel faults and fissures, often creating immediately retention centers of the worst type, a better understanding is needed of the enamel surfaces, and more particularly as to what actually covers them to the dissipation or conservation of the cement line; the writer is fortunate in being able to recall to your minds these conditions in words other than his own.

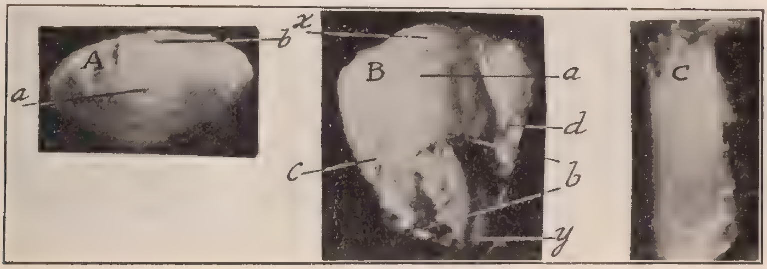


Fig. XXI

Fig. XXI. Caval and lingual views of a large porcelain contour in a normal mouth about two years.

A--The gingival seat. Note that the only loss of cement is at "b," where the porcelain is exposed from solution just at the gingivus; "a" cement intact.

B—The entire pulpal wall from x gingival to y incisal; the cement "a" is perfectly preserved except at "b," where it is stained from exposure due to pump from bite stress in the incisal triangle. Note the little solution on the labial wall at "c" as compared to the deep washout at "b."

C—The lingual view showing contour, and loss of cement shown in A gingivally.

Miller[7] tells of a film of micro-organism which covers the surfaces of all teeth, from 100 taken at random out of 1,000 teeth in two different experiments, and stained by eosin and the Gramm method, he says: "I was surprised at the universal presence and extent of the films; of the molars and bicuspids, only the cusps, and usually a small portion of the buccal, and less of the lingual surfaces, were found free from films; of the incisors and canines, the labial surfaces showed a film without a single exception; at the neck of the tooth, where the enamel was completely protected by the gum, there was no film. . . . . Fissures, grooves, pits and depressions of all kinds are indicated by deeper staining and denser films. I was curious to see how the teeth of my colleague, Dr. York, who is immune to caries, reacted. . . . . on the whole, Dr. York's teeth, being carefully kept and highly polished, show the film restricted chiefly to the cervical portions and proximal surfaces.''

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[7] Miller, W. D.—The Presence of Bacterial Plaques on the Surfaces of the Teeth and Their Significance.—*Dental Cosmos,* 1902.

Again, he says, in answering the question, are the bacteria films or plaques restricted to carious teeth? ''The question is very easily answered in the negative. They are not characteristic of carious teeth, but of dirty teeth or rather of teeth whose surfaces are not kept perfectly cleansed by either natural or artificial friction. Teeth which are not kept clean by the process of mastication; teeth without antagonists; loose teeth which oscillate in the mouth, are covered with greasy deposits (''materia alba'' of Leeuewenhoek) show most abundant growths: in fact, it would be very difficult to find teeth which did not show bacteria adhering to the surfaces at some point or other.''

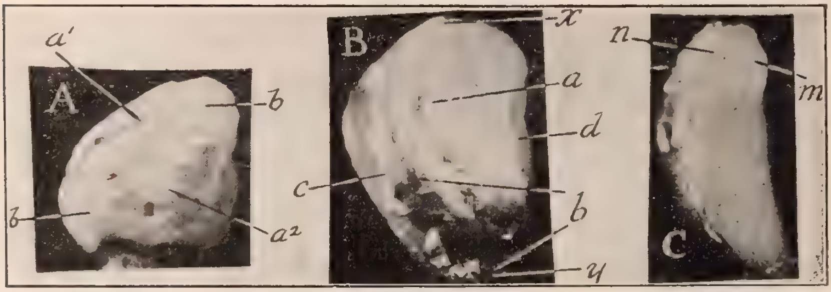

Fig. XXII
(Compare with Fig. XXI.)

Fig. XXII. Caval and lingual views of a large porcelain contour in a mouth of the erosion type about two years.

A—The gingival seat. Note the great loss of cement at ''b'' in the two gingival angles where exposed to acid saliva and its protection by the gingivus at a'; the character of the caval cement at a^2 is not as good as in A, Fig. XXI.

B—The entire pulpal wall from ''x'' gingival to ''y'' incisal; the cement ''a'' is in poor shape, having lost its retentive value; at ''b'' it is stained for the same reasons as in B. Fig. XXI; it is completely lost along the entire labial and lingual at ''c'' and ''d,'' allowing entrance of light rays, producing perfect color but proving the solvent power of a saliva loaded with acid sodium salts.

C—The lingual view showing contour and complete loss of cement from ''n'' to ''m'' on the linguo-gingival angle.

Later, he says, ''We may put it down as an axiom that films will be found wherever the surfaces of the teeth are are not kept free from deposits of mucus, epithelium, food, etc.,'' Fig. XXIII.

Lastly, in discussing the existence of the gelatinoid plaque, he remarks, ''If the food accumulated on the surfaces or in the cavity undergoing fermentation, it is readily conceivable that a special growth of bacteria in immediate contact with the surface of the teeth would intensify the action at that point, though fermentation itself would certainly not be solely dependent on such growth; if there is an accumulation of nitrogenous food, or if the surface of the tooth is coated with a greasy layer of mucus, epithelium, etc., there will be putrid decomposition with alkaline reaction, which again may be most intense directly on the surface. *In such cases it is conceivable that the film might serve as a protection to the tooth."* (The italics are mine.)

You will note that Miller describes these films as covering all teeth, normal as well as carious, the film consisting of mucus (to which Kirk, Lohman, etc., give 25% carbo-hydrate and 75% nitrogenous-moiety), epithelial scales, organism, etc., so the decomposition of this film in the normal would be a nitrogenous material, *putrid and alkaline,* protective in all but the retention centers for carbo-hydrate foods, which would then raise the acidity to the point of decalcification, but if the percentage of carbo-hydrate in the mucus is raised, as in the Hypo-acid diathesis, lactic acid fermentation takes place in the film and caries becomes general, unless the acid is diluted by the entrance of saliva, due to the porosity of the film.

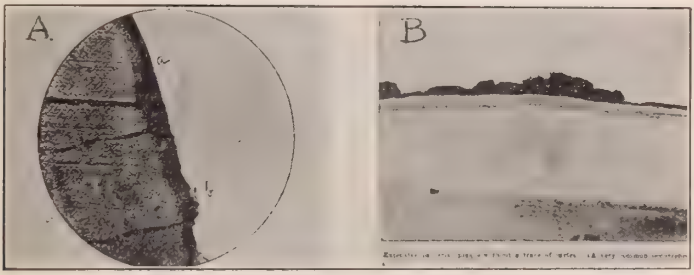

Fig. XXIII

Fig. XXIII. From Miller's "The Presence of Bacterial Plaques on the Surfaces of the Teeth and Their Significance," *Cosmos*, 1902, showing that films may occur without caries.

It is interesting in this connection to quote J. Leon Williams[8] on these films under carious condition. He says: "I have ground more than four hundred sections of enamel in every stage of decay of the teeth—in one respect every specimen has shown precisely the same appearance: lining cavities or covering surfaces where decay has commenced, there is always to be seen a thick felt-like mass of acid, forming micro-organisms. This mass of fungi is so dense and adhesive as to make it highly improbable that enamel is affected except in rare or special instances by any acid other than that which is being excreted by bacteria at the very point where the enamel is attacked," Fig. XXIV.

It will be seen from the above that Williams studied the film in the abnormal. He will not admit that this film may be permeated by a general mouth acidity except "in special instances," one of which we take to be erosion types mentioned before, where the films do not exist at all, or are very slight, the saliva being acid from the acid-sodium salts, the mucus which goes to make films being held in solution; it is interesting to note that these are the very types where the cement line fails most rapidly, so that it would appear that the film is protective of the cement line unless, as he says, acid be formed in and under it or "at the very point where enamel is attacked" under the cover of the film, and this again is most convincing, for it is the other and opposite type of mouth acidity, the Hypo-acid, where the carbohydrate percentage in the mucus is so high as to produce acid fermentation in the film.

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[8] Williams, J. Leon—A Contribution to the Study of Pathology of Enamel.—*Dental Cosmos,* 1897.

Black disagrees sharply with Williams in associating all films with caries, saying, "It seemed that he included all manner of material that contained micro organisms (practically any material clinging to the teeth contains them), going wide of the line of those forms known to produce caries. "He seems also to have included deposits through which water would run so easily that they would be no bar to the washings by saliva; such coatings are found plentifully over the surfaces of teeth of immune persons, and also in others where there is no decay of enamel. Careful study shows that many kinds of deposits upon the teeth present similar appearances when seen in microscopic section to those produced by gelatinous plaques and yet seem to have no influence whatever on the localization of caries[3]," Fig. XXIII.

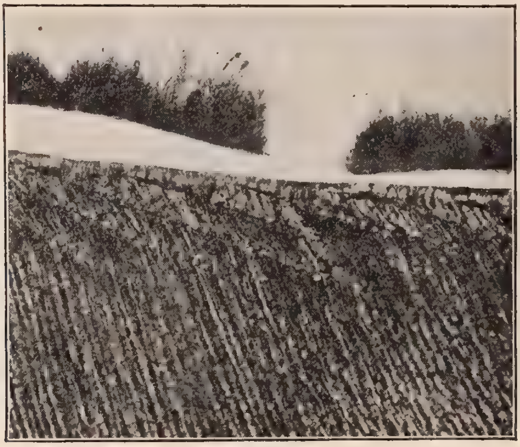

Fig. XXIV

Fig. XXIV. From J. Leon Williams' "A Contribution to the Study of Pathology of Enamel," *Cosmos*, 1897, showing film present on all teeth.

Black[10] agrees with Williams that general mouth acidity cannot produce caries, and insists that caries is due to a special gelatinoid plaque, saying: "I want it understood that I mean a gelatinous substance. I do not mean accumulations of micro-organisms loosely held together on the surface of the tooth . . . . inspissated mucus . . . . greasy accumulations or any of these things; I mean a substance that is gelatinoid or gelatin-like . . . . not soluble or meltable as gelatin[9]. I have grown the plaque artifically, have seen it in large numbers, and I am sure that under certain dietetic conditions it is produced."

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[10] Black, G. V.—Discussion of Miller's Paper: A Study of Certain Questions Relating to the Pathology of the Teeth. Proceedings, Fourth International Dental Congress, Vol. I.

Miller and Black thus both agree that films cover all teeth and do not necessarily mean caries.

Finally, Kirk[11] condenses the whole matter thus:

"The catchy formula that 'clean teeth will not decay' is misleading, even if true in the ideal sense . . . . first, because it is equally true that unclean teeth do not necessarily decay; and, second, it is practically impossible to always have clean teeth in the ideal sense. . . . For the reason just stated, dental caries cannot logically or scientifically, any more than from the standpoint of observed facts, be classed as a filth disease. . . . . More particularly has attention been called to the fact that fermenting particles of carbohydrate food debris adhering to tooth surfaces is not in itself sufficient to account for the phenomena of caries of the teeth; that the mixed saliva itself contains fermentable substances as it is excreted from the glands, and that this carbohydrate product of nutrition dialyzed from the blood plasma is the element found in the saliva of caries susceptibles which is the normal pabulum of the lactic acid bacteria concerned in the first stages of tooth caries . . . . salivary composition is a resultant of nutrition, and that in its turn is dependent in a large degree upon food habit."

It is thus shown that the chemical composition of the saliva and the growth and chemical composition of the films forming upon enamel surfaces is dependent upon the nutritional state, and this is most impressive when we find that the cement line is damaged most rapidly and without caries in the erosion mouths of the Hyper-acid diathesis, where there is coincident acidity of saliva and solution of mucus with few films; that it suffers almost as much, attended this time by rapid caries, in the mouths of the Hypo-acid diathesis, where there is a coincident acidity of saliva and excessive mucus, acid from its fermenting carbo-hydrate content forming a thick "felt" of acid films, Fig. XXIV., and finally, it is damaged least of all in the normal mouths, where the saliva and mucus are alkaline and films grow freely, but are alkaline from putrefaction of the normal nitrogenous content, Fig. XXIII.

It would thus appear that there is also something mechanically protective against mouth fluids in normal mucus and its film when the film is not acid-producing in itself, Williams saying, "This mass of fungi is so dense and adhesive as to make it highly improbable that enamel is affected by any acid other than that which is being excreted by bacteria at the very point where enamel is attacked,'' and Black insists on the tough adhesive agglutination to enamel surfaces of the gelatinoid plaque, maintaining that no dilutions can occur from the fluid of the saliva under these growths, Fig. XXIV.

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[9] Black, G. V.—Discussion, Report of the Committee on Scientific Research, Dental Society, State of New York.—*Dental Cosmos,* 1906.

[11] Kirk, E. C.—Editorial: Prophylaxis.—*Dental Cosmos,* Feb., 1911.

So we take it as proven that the only danger to the cement joint would be the excessive acidity of the contained film; the total absence or the continued displacement of the film, or so slight a growth as to allow entrance of a generally acid saliva, and while Black says, ''The acidity of the general saliva does not become sufficient to cause caries. Those immune to caries have saliva fully as acid as those intensely susceptible,''[3] it must be recalled from the work of Hinkins and Head that cement is much more vulnerable to mouth acids than is enamel.

Relative to the dangers of oral mucus, you are referred to the work of Lohman,[15] who claims that mucus is the direct acting cause of all carious processes, and to Kirk[16] and Miller's[18] discussion of this theory, with which they do not at all agree only in so far as has been previously quoted: the writer[6] believes that ''If mucus were destructive rather than preservative of enamel continuity, teeth in our race would cease to exist, so thoroughly are they encased by it.'' Of course this is the normal mouth mucus, the same no doubt to which Head[1] refers when he says of the cement line, ''The mucus gets into the fine line and acts as a capillary plug, preventing the constant interchange of solvent fluids.''

The presence of a protective film in inlay joints under certain conditions now understood cannot be questioned, as to just how the film protects the contained cement, that needs further investigation.

It is the writer's idea that films fill the crevice left by the earliest wash-out of the superficial cement almost as soon as the inlay is set, and, as soon as they are retained, alkaline putrefaction begins and the contained film becomes alkaline and discolors; if the film is of sufficient density and agglutination, the cement line is protected until the film is displaced, Fig. XIII. If the mouth be of the Hypo-acid diathesis, with its high percentage of carbohydrate in the film, acid fermentation occurs in the contained film, the lactic acid attacks the cement, which is alkaline, to solution until the acid is neutralized and the film becomes alkaline and protective; if this is displaced, as is often the case, the process repeats itself until the ''wash-out'' becomes so deep and the renewed film so acid, that it cannot be neutralized by the dissolving cement under it, when decalcification of the cavo-surface enamel occurs and caries begins.

It might be argued that the ordinary decalcification of enamel would also neutralize the acidity of the attacking film, and that caries should then

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15. Lohman, A.—A New Fact About Dental Caries.—*Archiv.*, June, 1904.
16. Kirk, E. C.—Editorial, ''Mucin as a Factor in Dental Caries.''—*Dental Cosmos*, 1904.
18. Miller, W. D.—New Theories Concerning Decay of Teeth.—*Dental Cosmos*, 1905.
6. Grieves, C. J.—Report of Work on Base vs. Noble Metals in Orthodontia.—*Items of Interest*, Feb., 1910.

cease, and it does, but only to begin again, as all know who have attempted carious cultures; for when the percentage of acidity of the culture media gets too high it must be neutralized by a slight addition of alkalines; it is just this intermittent alkalinity which makes caries of enamel possible, but the amount of alkalinity produced by slow caries of enamel is small when compared with the acid neutralization possible in rapid cement solution.

There are as many stages to this process of maintaining the alkalinity of the contained film as there are gradations from the normal, from the simple neutralization of a slightly acid film, and its agglutination and retention to the dangerous combination in the vulnerable mechanical areas named, where the cement and contained films are pumped out by bite stress, only to be replaced by other deeper acid films, and so on to complete joint destruction.

This is the usual history of the destruction of the ordinary cement filling, in the occlusal areas it is washed and the film rapidly removed; in the gingival areas the film is retained, but in such mass and constantly changing that it is neutralized by the alkalinity of the dissolving cement only to be replaced by a larger film of higher acidity, and there is no retention of film. From a protective standpoint, agglutination of the film and its retention are the most necessary things in inlay work, as shown by all these investigations, and, clinically, the rule holds good, viz., the finer the joint, the less the film; if it be acid, the less to neutralize, and the better the retention of it.

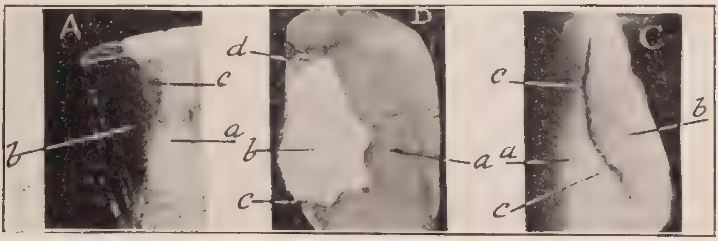

Fig. XXV

Fig. XXV. A—Linguo-incisal view of one of the best malleted gold contours the writer has ever examined, honed to the dentine; "a" dentine, "b" gold filling. Note the stain from leakage at "c" in the vulnerable incisal angle; time in the mouth, eight years.

B—A cross section cut through a bicuspid from bucco-gingival to linguo-occlusal of the best amalgam filling yet seen by the writer; "a" dentine, "b" amalgam filling, "d" edges failing from bite stress, "c" recurrent caries; time in the mouth, nine years.

C—View of the mesio-buccal angle bicuspid of a well-appearing silicate, six months in the mouth; "a" enamel, "b" silicate filling. Note the open joint at "c."

It is now easy to understand how the finest contact operations may fail while the ordinary cement-joint may stand in the same embrasure, for if the contact operation falls short at any point of absolute contact, capillarity acts, fluids enter, and the crevice fills with acid film, Fig. XXV., which so slowly attacks the cavo-surface enamel that the contained film, instead of being neutralized, receives just the percentage of alkalinity sufficient to maintain caries; in the cemented joint, as has been shown, the acidity of the film acts quickly on the more susceptible substance present, the cement, and the film is made alkaline, Fig. X., XI., XII., XIII.

With all these facts in mind the operator may approach a mouth for inlay work with some assurance of his knowledge, first of the diathesis, and by that judge how his work may stand, of the vulnerable areas in cavity preparation, and as to which type of joint he may use, porcelain and butt-joints for appearance when sheltered, or a shelter can be made by insetting in lap-joint gold inlays, which are always preferable for accuracy and durability.

Finally, the future of the method of inlaying fillings in teeth will be dark indeed, and this, the greatest boon of our times to both patient and operator, will be cast aside "as weighed and found wanting," if we, as a profession, are satisfied with present results. As seen in the light of these investigations the field is only just invaded. It will not do to accept the present cavo-surface union of porcelain inlays with the smug statement "That joints will wash out any way, so what's the use?" any more than it will serve to be comfortably pleased with our lap-joints in gold inlays. We are convinced that both butt and lap-joints by suitable technique must be made the equal of those found in the finest foil operations. It is going to demand some of the finest science, art and skill that our profession has ever displayed to do this thing, and we feel assured that in time the skill will be displayed, the science applied, the art demanded put to practice, for never yet have we, as a profession, failed, when convinced of the need, in the accomplishment ofttimes of the seemingly impossible.

(*Discussion in next issue*)

THE INTRODUCTION OF ORAL PROPHYLAXIS INTO A DENTAL PRACTICE.*

By Robin Adair, B. S., M. D., D. D. S., Atlanta, Ga.

Professor Prophylaxis and Pyorrhea, Southern Dental College, Oral Surgeon to Grady Hospital.

SEVERAL years ago the dental profession was confronted by the fact of one of its members, a competent dentist, a social favorite, a refined and cultured gentleman, being blacklisted from membership in a swell social club for no other reason than that he was interested in prophylaxis and that he "cleaned teeth." Nor was this stigma on prophylaxis confined to the laity. Dentists seem to think it beneath their dignity to clean teeth, and if done is relegated to the assistant or to the dental nurse. Others tell us that "It takes a crank to work prophylaxis."

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*Read before Florida State Dental Society, June 21, 1911.

SOME INSIGHT AS TO THE HISTORY OF PROPHYLAXIS

Dr. Levi C. Taylor of Hartford, Conn., wrote me on Feb. 7, '05: "I find upon investigation that 'prophylactic' means a medicine or medical treatment, the word being very old in this connection. Dr. M. L. Rhein took exception to this and claimed it to be of a word from a tooth brush in 1882. Prophylaxis came into use in the sixties and was defined by Donaldson in 1874 very much as I defined it at your meeting, "surgical or manipulative treatment for the preservation of teeth." That both are a treatment no one will deny, but I do believe that each has a proper meaning. Men and women both belong to the human family, but who would think of interchanging these as meaning one and the same thing?

Dr. M. L. Rhein wrote me a letter on June 10 in which he said, "I don't believe it makes much difference whether you use the word as an adjective or a noun; what I said in Washington was that I was the first person to introduce the word into dental nomenclature when I introduced the prophylactic brush in 1883 and having first made use of the word in that sense, I thought its very use, by virtue of priority, entitled it to be used in that way."

Dr. D. D. Smith writes me on June 10th, "that Dr. Rhein is entitled to no credit for original work in this matter. He never heard of it or thought of it until I published my first paper in 1898. "Prophylactic" is a remedy and should only be used adjectively. Prophylaxis is never used as an adjective, but as a process or descriptive of a process. Prophylaxis is not a preventive remedy, but a preventive process. You will find these terms used interchangeably in the dental nurse paper and without any discrimination."

On June 18th Dr. Rhein again wrote me "That not one patient out of 500 would understand your purport, although they may declare that they do. I find it necessary to impress these truths upon them again and again to make them understand. I don't care a rap about what I call this treatment to my patients. I believe that what they can understand most plainly is the proper term to use, therefore, I never say prophylactic treatment or prophylaxis to them. Plain English is the best thing to use at all times with a layman. Therefore, I tell them that the cleaning and polishing of their teeth and massaging of their gums, done frequently, is the best preventive treatment that we have in dentistry. It is all very well to use these words professionally, but plain English is the thing for our patients."

Leaving each individual to take his choice between these opposite opinions and omitting any and all special methods of treatment, I shall at once introduce my subject by the statement which I believe will be generally accepted, that nearly all our dental operations are necessitated by unclean and infected mouths. Then is it not strange that we as dentists have failed to keep those mouths clean? Is it not strange that we have treated this abscess, filled this tooth, operated for Rigg's disease, and thinking it beneath us to clean the mouth so as to prevent these operations? I know that there are many here who will say that they have practiced cleaning all their professional life, and that these things will happen anyway. But the fact remains that you are mistaken, for a thorough search has been made of all available dental literature and no mention of systematic prophylaxis treatment was made up to the year 1898. About this year two prominent dentists began to investigate those infected mouths and to publish their views and results. Still few dentists took up the work. In public exhibitions the actual results were shown by submitting patients who had been under prophylaxic treatment. Drs. Kirk, Darby, Holly Smith and others were enthused and wrote of what they saw, but the work went no further until the investigators nearly gave up hope, and as one of them expressed it, "went home tired, despondent, and with the feeling that he had done his best and that as the dental profession had repudiated his work, he would make no further effort." But he kept at it and evolved the system of prophylaxis on the principles of etiology that has accomplished results that have forced us to see the wonderful development there is in store for us, until we now see the dental journals teeming with some new phase in every issue.

Our study and practice up to the present time has been etiology and restoration. It must of necessity be etiology and prevention. Until oral prophylaxis treatment was accepted and understood, etiology was the subject that dental authors wrote volumes about and spun theories that now seem ridiculous when we meet them in reading.

Detail would make this paper too long, and I shall confine myself to facts that have been established beyond peradventure:

1st. That the etiology for the larger percent of dental operations is traceable to local infection.

2nd. That tooth decay is from without and caused from constant immersion in an infected environment.

3rd. That diseased gums, whether simple gingivitis, Rigg's disease, or enlarged glands, are rarely traceable to constitutional causes as uremia, or syphilis, but generally to an infected mouth.

If you accept these well-established truths, I may hope for your interest in the remaining part of this paper. The medical profession has just emerged from a transformation of its methods from an "all treatment" to prevention and sanitation. Instead of giving all its time to the treatment of malaria, medical men now turn to the cause and by prophylactic measures or sanitation seek the death of mosquitoes. The up-to-date physician now watches the surroundings of his patients to prevent typhoid fever. He takes all precautions to prevent smallpox, scarlet fever, and diphtheria. "To cure is the voice of the past, to prevent is the Divine whisper of today."

Two leaders in this great work of prophylaxis, Dr. M. L. Rhein, of New York, and Dr. D. D. Smith, of Philadelphia, both believe alike that this is the most important part of a dentist's work, but they differ decidedly as to how to put the work into execution.

Dr. Rhein claims that all patients should receive the benefit, and that if he did the work he would have little time for anything else and the charges for the treatments would be a burden to the patient to pay for at the rate of $5.00 to $15.00 per hour for twelve treatments each year. He contends that the work is not so difficult but that an assistant can learn to do it in a short time, and he has introduced the "Dental Nurse" into practice, whose duty it is to perform this work for his patients at a nominal charge.

Dr. Smith, on the other hand, won't agree with any of Dr. Rhein's ideas, and contends that prophylaxis is the most difficult thing that the dentist can be called upon to perform, that inasmuch as it is the best thing that a dentist can do for his patients, and that it takes a great amount of skill, the patient should not go into the hands of an assistant, but that the dentist must charge accordingly and do the work himself.

INTRODUCING THE WORK INTO PRACTICE

If you determine to introduce this work into your practice, the next thing is, how best to accomplish it. Remember that it took Dr. Smith one year to induce 25 patients to submit to the treatments. Others had an equally hard time in the beginning. Dr. Crouse said he could not get his patients to come at regular intervals.

All dentists have patients who will appreciate an effort in this direction if they only know of its advantages. Some of these patients you will not see for six months. To take the time and call up each one, and take from fifteen to thirty minutes explaining the system, is out of the question. To start the work, you must have a small number, at least, to make the work interesting. The only practical way seems to send these patients some literature, or reprints from some reputable dentist or society, describing the treatment and what you hope to accomplish. You will be criticized by some of your special friends for sending out this pamphlet, so you had best not use your name on it at all. Dr. Corley can furnish you with any number of good articles to be used for this purpose. Dental ethics should be upheld, but if they prevent us from spreading knowledge among our patients they should be amended. An extract from *The Dental Digest* on "Ethics" reads, "Our duty to our patients is considered first," which is right. However great our love for and devotion to our profession and its members may be, the greatest good of the patient should be our first consideration. Anything short of seeking the best methods and rendering our best services is unethical. Anything that tends to educate the dental patients along dental lines should be encouraged, especially if it be on the subject of oral hygiene.

After experiencing all kinds of difficulties, you will finally persuade or almost force your best patients to submit to having their mouths attended to each month. One plan is to designate a day in each month for the special work. Mrs. Smith's appointment is on the 10th of each month, and she will be reminded the day previous to be on time; and so on with the list. The usual ridicule by a few of your dental friends of your "advertising schemes," as they will call it, will soon swell your list to such an extent that you will either have to turn the work over to an assistant, thin the ranks by charging more, or to get up some scheme by which to continue the work at a nominal price to the patient.

Our plan is to devote certain days in each month to this work, as the second Tuesday, second Thursday, second Saturday, and the second Wednesday in each month. At 8:30 o'clock I expect Mrs. Jones, and so throughout the day you can treat from 12 to 20 patients on each one of the days. The office maid can attend to the remaining, and as the charge is entered for a year, failure to meet these engagements results in loss to the patient. It in no way interferes with your regular work of restoration for those patients who are irresponsive to your efforts to save them much of this expense, pain, and trouble.

For several years don't expect this work to enrich your pocketbook. Far from it! The work is rather sweet charity, for I doubt whether the day's work of prophylaxis will more than pay expenses, and I am sure that it will reduce your income one-fifth anyway, as these patients are the cream of your practice, and few of them will have new caries and their mouths soon will be in such a healthy condition that other dental operations are unnecessary. The reason for this pecuniary deficit that you will experience is well explained by giving an extract from a letter written to me by a prominent surgeon, a man who would get from $50.00 to $200.00 for an hour's surgery. He wrote me: "Before patronizing you I had been getting my teeth cleaned by reputable men from $1.00 to $1.50 and the only reason for transferring my patronage was my friendship for you and my inclination to help a young man. But I do not think my pocketbook is commensurate with your new prices and I am glad and think you are to be congratulated if you can get prices above the older men in your profession."

If I am reliably informed, many prominent dentists do this work for nothing, and sometimes they get as much as 50 cents, though they won't admit the charge to a professional brother. But, seriously, the scheme is to introduce this important work at such a cost to the patient that he won't feel it. Do it for nothing if you can't get patients any other way. You will soon get them interested and good results will follow. You will get more than you can attend to and then dismiss those who will not pay a reasonable fee.

DENTISTS AND THEIR MOUTHS

We cannot teach others what we do not know or practice ourselves, and dentists are the first who need this instruction. What a record it would make if the mouths of every dentist here were inspected at this moment! I can tell you without examination, for I visited the offices of twenty prominent dentists, interviewing them on their personal care of their teeth, and to see if they were making any attempt at introducing any systematic prevention treatment. I find that most of them chew and smoke. There were seven dentists out of the twenty with fairly clean mouths. Six were afflicted with pyorrhea; only one making any effort toward systematic measures for prevention with his patients.

TECHNIC

The air of mystery has been thrown about prophylaxis by some of its leaders. Results have been gladly shown, but when it came to the way of doing it, that was another thing, so that the general practitioner does not get at the root of the matter.

If you ask me my method of treatment, I will tell you that I have none, except to scrub and polish the teeth and massage the gums. I use the word ''scrub'' advisedly, although I know that Dr. Smith will hold up his hands in horror when he hears the word. As long as you handle so gently that tender gum that bleeds at the slightest touch, as long as you look upon teeth as fragile structures that will be harmed if polished, you will fail at prophylaxis treatment. No man ever possessed a clean mouth by gentle handling of the brush and water alone. On the other hand, no person ever had his teeth injured by any good dentifrice or mouth wash. All I have to say is that the person who thinks he keeps a clean mouth by simply brushing the teeth is greatly deceived, and the dentist who thinks the same thing has never seen a perfectly clean set of teeth that have been under this prophylaxis treatment. Use any method or all of them. Use only the Smith method of hand polishing with orange wood and pumice, if you will do it well. Use any agent that you like that will not chemically affect the teeth. Use the dental engine or not, as you like. Only be sure that you polish those teeth, at least, once per month. You can get the rust off from a piece of iron by cleaning it, but it is another thing to polish that iron. When you clean teeth you leave a ground glass surface to which tartar and secretions will adhere, but not so when you polish them on every surface.

EDUCATE YOUR PATIENT

Another important item to be considered in this scheme of mine is for the dentist to *talk, talk, talk* all the time while operating. Not of theaters or receptions, but of the importance of oral hygiene, what you have accomplished, what you hope to accomplish, and what he must do to assist you. Repeat the same thing at the next sitting, for in a month's time he has forgotten it all, and it will be new information to him.

I often turn down the pages in dental journals at papers and discussions on prophylaxis, and should I have to keep a patient waiting he is requested to read these articles and to discuss them with me. In about three months, even the uncouth, gawky, rough, don't-care boy of 15 years will get interested in his teeth and you will have smooth sailing from then on.

Before new patients are permitted to enter for treatment they should have their mouths cleaned up in the usual way by removing all deposits and filling all cavities. For prophylaxis presupposes a clean and patched mouth to work upon. This work should be done on regular operating days, and the usual charge made for same.

At the request of some of your members I herewith give you some idea of how this work is carried on in my practice and the system used. These were published in detail in *The Dental Digest* for February, 1910.

How to systematically give a large number of patients this treatment each month and do enough other work to make a living was a problem. I read all the magazine articles on Prophylaxis — of how others did it — the beautiful results. Heard many talks at dental conventions and went to see these "song birds" to find out in many cases there was no prophylaxis going on in their offices, except at the point of their pens and tongues. So I thought of giving it up altogether; but when I viewed the fine results and thought about how hard I had worked for years to build it up, I could not then desert my patients.

The second Monday, Tuesday, Wednesday, Thursday, Friday and Saturday in each month were set aside *exclusively* for this work. This would enable me to treat on an average fifteen patients each day, or one hundred for the week. It was out of the question to 'phone so large a number, so I had printed a card of notification which was mailed the day previous to the appointment. A large number to treat and nothing else on hand made it very interesting both to myself and patient. But it was hard work and did not amount to as much financially as regular work would have been, and besides my best and richest patients were beginning to have little or no dental work to do as a result of these treatments.

It makes a big difference whether a fellow is well paid for his work or not, and I knew if I were better paid I would feel more like giving a week to this work.

Now I had always thought like Dr. Smith, "that this work was the best service I rendered" and that it required more skill and should be well paid for, but then there was the class represented by appreciative patients with moderate income.

The final result of it all was that I did the thing so much condemned by Dr. Smith but advocated by Dr. Rhein—engaged the service of the dental nurse. I advertised and talked with 150 applicants before I accepted a middle-aged trained nurse who now does the larger part of this work in my office. She first helped me at the chair, then took a course by reading everything published on the subject; she also brought in her kinsfolks' children and her friends to practice on. On regular patients I would do the difficult part and have her finish the treatment. Thus she became proficient and self-confident, while the patients are delighted with the novelty of the idea.

DR. ROBIN ADAIR

RESPECTFULLY ANNOUNCES TO HIS PATIENTS
THE SERVICES OF A TRAINED DENTAL NURSE
TO PRACTICE ORAL PROPHYLAXIS UNDER HIS
DIRECTION AT A MINIMUM FEE
THE TRAINING OF CHILDREN IN THE PROPER
CARE OF THEIR TEETH HER SPECIALTY

PHONE MAIN 2442

The above card was sent to all my patients to let them know about the dental nurse. When I saw she was a success I quit the work, except to those who were willing to pay well for my service, and sent out, as "per suggestion by Bro. Bill," a card like this:

DR. ROBIN ADAIR

RESPECTFULLY ANNOUNCES THAT ON DECEMBER THE FIRST HIS FEES FOR ORAL PROPHYLAXIS WILL BE ADVANCED

NOVEMBER 26, 1909

Now let me describe what happens when a patient—Mr. Jones—is talked into or expresses a desire to take prophylaxis treatment. He is given the pamphlet, as described in first part of this paper, with instructions to read it and come back the next day. I must know that he understands the demands and that he is willing to follow instructions.

When he returns I usually say "I would like to give you an appointment to suit you. I can give you Monday morning at 9 o'clock or Friday at 3 p. m." He takes Monday morning and his name is entered.

Part of Page from "Permanent Engagement Book"
Prophylaxis Engagements for the Second Monday in Each Month.

8:30—MRS. WM. SMITH
419 Piedmont Avenue
'Phone 490

9:00—MR. FRANK JONES
43 Peachtree Street
'Phone 8960

10:00—MISS RUBY SIMPSON
76 Johnson Avenue
'Phone 2442

Second Monday in Each Month

The day before his first engagement he receives a postal card with his dates, thus:

SECOND MONDAY IN EACH MONTH

DATES FOR PROPHYLAXIS TREATMENT

PRESERVE THIS CARD

January	Monday	10,	at 9	o'clock
February	"	14	"	"
March	"	14	"	"
April	"	11	"	"
May	"	9	"	"
June	"	13	"	"
July	"	11	"	"
August	"	8	"	"
September	"	12	"	"
October	"	10	"	"
November	"	7	"	"
December	"	12	"	"

Charge $Z per year.

A reminder card will be mailed previous to each date but failure to receive such notice does not entitle patient to another engagement in the same month without extra charge, unless failure to be present is due to unavoidable cause, in which event notice must be given several hours in advance.

The charge for Prophylaxis is by the year for twelve regular engagements, and is payable semi-annually in advance. If for any cause these treatments be discontinued before the expiration of contracted time a charge of $XX will be made for each date up to the time notice is received to discontinue.

Appointments are not to be changed more than three times per year.

ADAIR & ADAIR, Dentists
319 Grant Building Bell Phone 2442
Atlanta, Georgia

For each succeeding engagement he gets a postal card very similar, like this:

YOUR ENGAGEMENT FOR PROPHYLAXIS IS MONDAY
FEB. 14, AT 9 O'CLOCK.

The charge for treatment is by the year from date of first engagement and is payable in advance. The date and hour fixed, if possible, to conform to convenience of patient and is not to be changed oftener than twice a year.

As this time is reserved, failure to meet engagement results in loss to patient and cannot be made up unless the absence is caused by Providential hindrance, in which event notice must be given a day in advance.

Atlanta, Ga.
Bell Phone 2442
ADAIR & ADAIR, Dentists,

These cards are neatly printed and only the dates have to be filled in by our secretary.

At the first appointment we enter the charge for the year. On the ledger sheet we enter a note of all small cavities, defects and the general condition of his mouth. At the first treatment Mr. Jones is sold two brushes, floss silk and dentifrice cream, and taught their use. One brush has his name on the handle and is left in my office to be used for further teaching at each appointment.

Our printed instructions are a modification of those used by Dr. Kells of New Orleans.

> ### DIRECTIONS FOR THE PROPER CARE OF THE TEETH
>
> Upon RISING the teeth and gums should be most carefully, thoroughly and CORRECTLY BRUSHED—using a soft grade tooth brush and "AA Dentifrice Cream."
>
> After BREAKFAST, waxed floss silk should be passed between the teeth (be careful not to snap it down hard upon the gums, as this would injure them) or a quill tooth pick should be used—never use a wood tooth pick.
>
> After DINNER or luncheon, when possible, waxed floss silk or a quill tooth pick should be used and the mouth most thoroughly washed with "AA Dental Mouth Wash," if convenient—otherwise with clear water.
>
> After SUPPER repeat the above.
>
> Just before RETIRING the teeth should be again thoroughly and CORRECTLY brushed with "AA Dentifrice Cream" and the mouth thoroughly rinsed with "AA Dental Mouth Wash."
>
> Don't brush across—brush the under teeth up and the upper teeth down—brush hard—you cannot injure the teeth or gums with "AA" preparations; the gums will soon become hard, firm and healthy.
>
> For foul breath nothing equals the pleasant odor, taste, and antiseptic qualities of "AA Dental Mouth Wash," which should be used in good, big mouthfuls and retained as long as possible. Keep the teeth shut and alternately distend and draw in the cheeks, forcing the fluid between the teeth.
>
> Nothing short of the above constitutes good care of the teeth.
>
> ROBIN ADAIR.
>
> *(Tack this card above tooth brush holder.)*

Mr. Jones at first may not understand all this "monkey business" of dates and cards, but the system makes him very much interested. About the third visit the result becomes apparent, and he is my "patient to command."

The system described has been evolved out of a five-year study for the best method to handle this work.

RESULT OF WORK

Patients now present themselves each month, and we feel greatly encouraged to see these mouths free from sensitive teeth and from decay. This changed condition has been maintained until the general health has been greatly benefited, as it has prevented the introduction into the stomach and lungs of a lesser quantity of toxic products. These teeth present a polished appearance that add to the looks of the possessor, and will prolong the life and usefulness of the teeth.

Other dentists are accomplishing these results. Why not all of us?

I plead for you as dentists to have your teeth polished by your fellow practitioner so that you may know personally the joys of a clean mouth, then you are in a position to impart this knowledge to your patients.

I plead for action as well as enthusiasm. I would that we could get out such a pamphlet as would explain to the laity what this treatment means, and that every dentist would do something toward educating his clientele.

I plead for you to devote one, two or three days in each month to this work. You will not miss the time, and it will repay you in knowledge gained and satisfaction of duty done, if not in dollars.

Let us arouse some genuine interest and act in such a way that we can go forward in this work that will prolong the life of the dental organs and add to the looks and health of mankind.

BUSINESS IN DENTISTRY.*

By Edward Everett Haverstick, St. Louis, Mo.

THE business side of dentistry has been sadly neglected until recently, and I am glad that so many excellent papers on this subject have appeared in the dental journals during the past few months.

However timid we may feel regarding the business in dentistry, still in justice to ourselves and our families we should consider and study that phase of our work in so far as the plans resulting from such study will not interfere with our professional standard. Indeed, it is the aim and hope that such study will benefit the profession both ethically and financially in the same way that the study of definite commercial principles has developed and benefited every branch of business that exists today.

In studying this subject, I wish to consider it briefly under three heads; i. e., first the man, second the income, and third the investment of the income.

"In the hills of life there are two trails. One lies along the higher sunlit fields where those who journey see afar, and the light lingers even when the sun is down; and one leads to the lower ground, where those who travel, as they go, look always back over their shoulders with eyes of dread, and gloomy shadows gather long before the day is done."

I have given the above quotation from Harold Bell Wright in order to get the sentiment, expressed in it, placed firmly in the minds of those who read what is to be said. For the success in the business side of dentistry depends on how closely the person adheres to this high ideal, how closely he watches the path and at each division follows the one that leads to the "higher sunlit fields," provided he possesses some other qualities such as good judgment, an abundance of energy, and some humor, together with a thorough knowledge of dentistry.

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*Read before the St. Louis Society of Dental Science.

Dr. J. Leon Williams, Vol. LII, No. 11, page 1202, November, 1910, in the *Cosmos,* says that "What the young dental student of today most needs is not greater opportunity or greater variety of work, but a nobler ambition and a stronger will to take advantage of the rich opportunities already within his reach.

The childhood training of a dentist has much to do with his success in the business side of dentistry. He should have been taught the value of money by having had to earn it, the value of time, respectability, and honesty. He should have pride, ambition, tact, unquestionable character, and a strong will power. He should realize that he "must master himself if he would master others," that he should economize his energy in every possible way, and that he is to depend on his efforts alone to reach the goal. He must esteem his work of importance or he will not do it well and with that freedom of mind and zeal which clears the path for his unhampered progress. When the young dentist possessing these qualities sallies forth after a few years of strife and toil through self-denial and economy in a dental college and opens an office, not with all the equipment that the dental depots have to sell him, but the bare necessities for dental practice, success will be written in the history which tells of his life.

It is undoubtedly the aim of every one to provide a competence for old age and in some degree make a name for himself. In order to accomplish this it is necessary to do those things which satisfy and please his fellowmen. In this way he will surround himself by a host of friends who will bring him material from which he can make those things which satisfy the cravings of life. This fact is as true in dentistry as in the mercantile business. The good judgment which a dentist exercises in recommending what is best for a patient has much to do with his own success, and in all cases where it is possible it is best for both dentist and patient that the dentist recommend that which will last the longest and give the best service regardless of price. The only exception to this rule is, where the patient is unable to pay for gold or porcelain. Cement fillings and temporary work always reflect to the disadvantage of the dentist except in children's teeth.

Dentistry is a noble science filled with great and good men, many of whom have perhaps sacrificed too much time for their own financial welfare, but the good they have done for humanity can never be estimated, and dentistry still has great opportunities even to a financial advantage. So a dentist, who has thoroughly prepared himself in the fundamental principles of the science, who is not satisfied with the results of his labors and who is not accomplishing the aim in life referred to above, cannot say that it is the fault of dentistry, but it is on account of one of these three things; namely, first, he is not doing every piece of work with the utmost care and to the best of his ability to the minutest detail; or, second, he is underestimating the value of his ability and time; or, third, his business principles are wrong.

It is taken for granted that he has chosen dentistry for the purpose of earning a livelihood and to serve well his fellowmen. Also, he wishes to give himself the opportunity to obtain a broader education for the pleasure there is in education, broader than he would have had had he taken up some other line of work. Therefore, it is considered that dentists, as a rule, are a class of men with aspirations and sentiments above the average,—men who should be able to do well in the business world. But as a matter of fact, a dentist has practically no business ability at all. He hurries and worries so much that he is nervous. Do not worry, do not tarry, do it now, but do not hurry, should be his motto. A nervous man cannot transact business well; that is, he cannot make a bargain which is an advantage to himself. A business man should be cool and deliberate. It is on account of this very nervous state that many dentists do not even do their work at the chair as well as they would like to do it. Every imperfect operation is a detriment. Nervousness also accounts for lack of self possession, which weakens the personality and robs the dentist of a great asset. It causes many unnecessary and useless movements. Dr. J. Leon Williams says: "If almost any man will watch himself closely through one day, I think he will be astonished to see how many movements he makes which count for nothing and which result in no advance in his work. To cultivate to the utmost the avoidance of false movements is not only to secure great economy of time and energy for the dentist, but it is the most humane method for the patient. It is a curious but easily understood fact that in the work of excavating cavities the more or less false movements of timidity growing out of a desire not to hurt our patients really cause more pain than the work of the firm, sure, bold hand. Most patients are quick to see and appreciate this.

Let the dentist examine himself, compare himself, take an inventory to find what he has that will truly recommend him to his patients, or what he lacks to satisfy them. And let him do this now! So that when he goes to his office tomorrow it will be with the assurance, not that his patients owe him anything for services not rendered, but that patients are willing to pay liberally for a piece of good work, for sound judgment, and honest advice. It is HOW GOOD and not HOW CHEAP that pleases the people. Quality is always foremost in the minds of patients. And it is quality that will be remembered long after the fee has been forgotten. Indeed, quality may be underestimated if the fee is too low.

The card system is the simplest and most convenient method of keeping dental records. The card used should have a diagram of the teeth and a place for the name and address of the patient at the top. Beneath these should be printed vertically across the card the names of the various dental operations, so that a single mark under the proper column will indicate the operation. This system is simplicity itself. At the left side should be a column for the date of the operation and at the right a debit and credit column. When a new patient calls, the name, telephone number and address should be put on a card and a diagram of all the work to be performed made on the chart, so that at a moment's glance at any time in the future we can see what has been done and is to be done. Remarks may be written across the card. The cards of the patients to be operated during the day should be taken from the case in the morning and put at a place convenient to the operator, where notes may be made during the day and entries in the evening.

It is not well to tell a new patient the fee that will be expected for a piece of work before it is completed, especially if the dentist has in store something which will please and delight the patient, for the reason that she does not know how well he can do a dental operation. If he can make it more artistic and more durable, and with more gentleness and less pain than that patient has had her work done in the past, then these things will stand out and above the fee, and she will be his patient in the future. Whereas, on the other hand, the price may drive her away, and she may leave never to return with the high fee standing out in her mind as a black mark against the dentist. If, when the work is completed, she is dissatisfied with the fee and is honest, which question must be settled after the first sitting, she will pay the bill. She will have a beautiful, durable and serviceable piece of work which will always stand up and overshadow the dark mark high fee. She will forget the fee before she forgets the work, which will be a constant reminder of quality.

What shall the fee be? The most satisfactory answer to this question that I have yet seen is given in The Dental Summary, November, 1910, by Dr. Frederick C. Brush, of New York City. Dr. L. P. Bethel has an excellent paper in the same number, and Dr. S. D. Ruggles also has a splendid paper on investments. In Dr. Brush's answer he deals with the subject in a business-like manner. It would be well for all of us to read what he writes and follow his suggestions. He says that a young man engaging in the mercantile business invests his capital in a stock of goods, while a young man taking up dentistry invests his capital in an education. The capital for a dental education is the money expended, the money that could be earned during the time required to obtain the education, and the interest on both of these, all of which is estimated to be $5,000.00.

I quote below from Dr. Brush: "The furnishing of a reception room, operating room, laboratory, etc., will probable require about $1,500.00 (which I consider too high for a young man). These amounting to $6,500.00 are permanent investments and should return at least six per cent a year. Now let us consider the expenses, the cost of distribution. First there is the interest on the investment, which amounts to $390.00. As the equipment will need to be renewed once in about ten years, an allowance of ten per cent, amounting to $150.00, must be made for depreciation. The next item will be for rent which, placed at $400.00, will probably cover heat, light and janitor service. A young lady assistant will add probably another $300.00 to the expenses, and incidentally I might say that this is one of the best business investments that can be made. The next is that of general expense. Every dollar that you spend for dental magazines, every dollar that you pay for dues to your society, every dollar that you spend for attending a dental clinic or meeting is part of the expenses connected with the business and should not come out of your personal account, but should come out of the general expense account. Everything that pertains to the maintaining of the business or increasing your efficiency is expense and part of the cost of distribution. We will place this figure at $300.00. The dental supplies we will place at $300.00. Now comes the question of a salary. What would you have to pay a man to conduct your practice if you were compelled to give up for a time, some one to carry on the business as you are doing? Suppose we say $50.00 a week, which will be $2,500.00 per annum. If you had to pay that to some one else, you surely should pay it to yourself.

"Our estimated expense account will now be something like this:

Interest on investment	$ 390.00
Depreciation	150.00
Rent, etc.	400.00
Assistant	300.00
General expenses	300.00
Dental supplies	300.00
Salary	2,500.00
Total	$4,340.00

"We now have a total of some $4,500.00, which must be earned and collected if we are to receive a salary of $2,500.00 from the business."

When the 52 Sundays, 8 holidays and 30 days for recreation have been deducted from a year there will remain 275 days in which to earn $4,500, which is a fraction over $16.00 a day, or $2.00 an hour, and which must be earned every hour in order to pay expenses and have a salary of $50.00 a week. At first thought this might seem too high to a young man, and this is a young man's fee, but if he will consider that an electrical firm charges $39.60 a week for a man to do repair work besides a large commission on all supplies that are used, and figure in a few extra hours each day, he will see that the estimate is small. These men have nothing invested, no education, and do not work Saturday afternoon or Sunday—44 hours being counted a week.

I feel quite sure that you will all agree with what has been said in this paper, including the quotations, with perhaps the exception of the method of arriving at the fee. Let us examine the method: Do you charge a set fee for cleaning the teeth, for devitalizing a pulp, removing it and filling the root canals, for treating an abscess, for each amalgam filling, for each gold filling, regardless of the difficulty of the operation or the time consumed? I am sure that NO would be your unanimous answer. To this question, you say that one set of teeth may take longer to clean than another, and consequently you must have a larger fee. One tooth with torturous root canals may take more time than another, and so a larger fee; one cavity may be much larger and more difficult to prepare and fill, and consequently a larger fee is required. One patient may be much more nervous than another and take more time and be more fatiguing to the operator, and consequently a larger fee will be required. And so on with each operation. Therefore it becomes plain that whether you charge so much a filling (in which case the price varies) or so much an hour, you will always take into consideration the length of time consumed in an operation when arriving at the fee, so far as operative work is concerned. This leaves you free to charge what you think is just to yourself and to your patient for inlays, crowns, bridges, etc., and that charge should be separate from the charge made for preparing the cavity for an inlay or the roots of teeth for crowns or bridges. The sooner you who have not been using this method adopt it, the quicker will you relieve your patients of an injustice, and the easier will it be for you to arrive at a just fee. But this does not say that, on days when you do not feel well and unable to do a full hour's work in 60 minutes, you cannot lower the fee accordingly. Neither does it say that you shall not accommodate a poor person in the same manner. But have a high standard even if it cannot be reached at all times. Many charge too high a fee for fillings in comparison to the fee they receive for cleaning the teeth and treating root canals, and this is the reason that of all the poor work that is done in the mouth the poorest is done in cleaning the teeth and treating root canals.

How much shall the fee be? This must be regulated, as Dr. Brush says, by the supply and demand. If it costs you $2.00 an hour to do an operation, you certainly should not lose money by it. And when there is too much demand for your time at this fee, you are justified in raising it. Whether or not you will work for certain poor people at less than your regular fee per hour is left entirely with the individual. There are certain poor people who will control their nerves and for whom you are able to accomplish twice as much work in an hour as you are for some rich, nervous people, and in this way one may get greater value than another in an hour's time, but the greater value goes where it belongs and costs you nothing more and so is just to everyone concerned.

The making of appointments so that all of the time will be filled and so that patients will not have to wait requires a great deal of study and judgment and is of the greatest importance. To make an appointment and allot a patient a certain amount of time forces the dentist to decide which operation he shall do at the following sitting and how much time it will take. It is well to ask the patient which hour during the day she would like to come and then go over the days until you find an hour free so that the patient will have no excuse for not keeping the appointment, and if she does not keep it a charge should be made for the time, usually $2.00

an hour, but this may vary. If a tooth is being treated and requires a treatment before the day when you have an hour that is most satisfactory to the patient, then say to her that your tooth will require a treatment on a certain day, and I am sorry that I have only a certain hour. She will make it convenient to come, but when you can conveniently please her by letting her select the hour, do so.

A young man practicing in a large city with the qualifications referred to in the beginning of this paper, employing the business methods outlined, should earn during the third year of his practice $3,000.00 and should increase his earnings a thousand dollars a year for ten years, if he is willing to confine himself closely to his work. In small towns the earning capacity of a dentist will be less, but his expenses are also less, and his amusements are also less expensive. His opportunities for investment are equal, if not better.

The qualifications of the dentist himself have been considered and the method of earning fees, but if I should stop here, he would be poor indeed. However, the collection of fees will be considered in a few words: All questionable patients should pay cash, the next class should pay a retainer and then either weekly or monthly, and the patient whose credit is good beyond question should be sent a bill on the first of the month after the work has been completed, as they should not be hurried, and as that is the time when all bills are paid, also because it is much easier for the dentist to get out all the bills at one time. Send bills to the business addresses. Do not itemize a bill. If you should be disappointed in some one, follow the bill with a mild letter, or a telephone message, and keep on following it until the bill is collected. If necessary give it to a lawyer, but never to a collecting agency.

It has been said that "drink is the root of all evil," but the lack of economy is really the root. All salaried men from laborers to railway presidents and all men who receive fees whereby they can calculate at evening exactly what they have earned during the day, spend their money more freely and without obtaining full value for it than do farmers or merchants, who cannot tell so quickly whether their crops will yield or their stock of goods will sell at a profit, and when their crops do yield and their goods do sell at a profit, they have larger sums of money to invest and also better opportunities to invest it,—places where they need their money to carry on their business—better opportunities than salaried men and men of fees, who say at evening, "I have earned so much today and I can spend so much." They have two advantages: the advantage of the APPARENT NECESSITY OF ECONOMY, which is a wonderful power, and the advantage of the opportunity to invest their savings. As the salary men and the fee men see the money come in each night or week or month, their desires for comforts and pleasures grow, and many times their desires grow faster than their salaries or their fees. And such is the sad fate of too many dentists. If they can circumscribe their desires and keep them within due bounds, a competency will bless old age. A pleasant disposition, which is aided and stimulated by wholesome evening entertainment, although expensive, is not a breach of economy, but expenses should always be less than the income, for there comes a time, especially with dentists, when expenses will gradually increase and the income gradually decrease. Dissipation, which lasts long into the night, is extravagance which robs the dissipater of energy, which is a great asset, as well as it robs him of funds which should be saved.

It is sincerely hoped that the dentists will gradually develop more business-like principles in figuring the cost of different dental operations, so as to be able to know their net income, which, I fear, is much lower than it is thought to be. It is hoped also, that they will manage their income so as to make it reach as far as possible by buying their supplies in quantities and by taking advantage of the deposit system at the dental depots, which will net over 33% a year. What investment will pay so well?

Dentists and physicians are the "easy marks" for every new scheme which is promoted, and are put into a class by themselves with red pencil marks at the head of the list. When a promoter of any advertised scheme comes into your office, kick him out, for he laughs at the men of your profession for being so inexperienced.

The smaller the income the more careful should the individual be about the safety of the principal when investing the surplus of that income, and should never be tempted by the promise of high dividends or high interest. He must remember that the men in business circles have the first chance at those things, and if they do not want them, neither does he, for they are not safe. However, this does not bar the investment of money in local companies, for instance banks, especially in smaller towns, where the investor has known for a long time the officers and principal stockholders of such companies to be men of undoubted integrity, also men whose business ability has been thoroughly tested. Honesty alone is not sufficient in such cases. I have known investments in bank stock in small towns to yield an excellent income and the stock is not taxable. But such an investment, although comparatively safe, is rather a special one than one to be recommended in general.

The general investments to be recommended are first mortgages on real estate, debenture bonds, state bonds, municipal bonds, school bonds, county bonds, or United States Government bonds, all being safe, and the United States bonds being non-taxable, and all a means of raising money in case of necessity. As a protection a dentist should carry a straight life insurance policy, at least equal to his annual income, in some reliable company, and an accident policy of not less than $2,000.00, preferably $5,000.00

Income real estate is an excellent investment for a dentist, if the investor will study well the condition, because it is safe and gives him a pleasant recreation in looking after it. It also has the advantage of stimulating economy and offering a speculative feature on a safe basis, if the investor will deal in income property which will pay the interest on all the investment or property which may be turned immediately into income property. Business real estate is far preferable to resident real estate, as the requirements in repairs will not be so great and as business men are usually easier to deal with in the question of rents than women.

Above all things, localize your investments; that is, invest your savings in your home town or city, where you can look after it ALL of the time and without the expense of agents or traveling expenses. The opportunities are just as great at home, although they may not sound so great, because you know the details of them better, which trims off some of the flowers. "Distance lends enchantment" to investments as well as "to the mountain view," and so distance investments should be positively avoided.

SYPHILIS IN DENTISTRY*

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(*Continued from page 760, November Dental Summary*

Alopecia, or loss of hair, is more particularly noticed when it occurs upon the head. Alopecia may be primary or consecutive. Both varieties may occur together and, in either, the loss of the hair may be slow or rapid, complete or irregular.

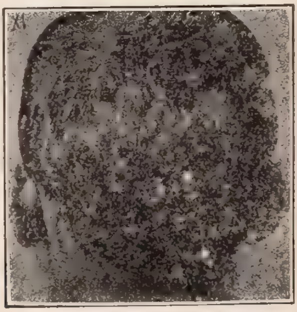


Fig. 11—Moth-eaten form of syphilitic alopecia.

Baldness is not permanent unless lesions attack and destroy the hair roots. Primary cranial alopecia may occur as a general thinning of the hair, or in patches.

Consecutive cranial alopecia usually results in permanent baldness over the area involved, because the syphilitic lesion destroys the hair roots.

Primary alopecia begins abruptly and, in a short time, the scalp has the appearance of being but scantily covered. It frequently is more noticeable upon the sides of the head. The eyebrows may drop out and the lashes be thinned.

The thinning of the hair may be more apparent in circumscribed areas, giving the appearance of patches, but on the floor of these patches may be seen stumpy hairs and the well defined follicles of the scalp. The patches are somewhat scaly and the hair dry and brittle.

Alopecia, appearing as patches, presents a moth-eaten appearance of the hair, resembling mange. The hairs are dry and brittle and lusterless.

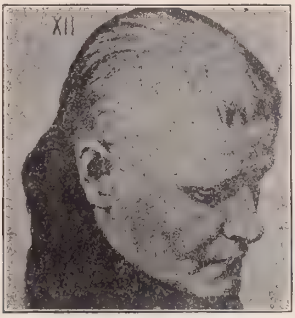


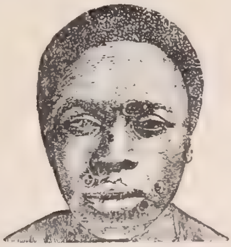
Fig. 12—Primary, general shedding of syphilitic alopecia.

The patches are irregular in outline and, by fusion, may become gyrate. The hair follicles are prominent and, from the floor of the involved area, may be seen an occasional hair growing.

Alopecia may be mistaken for middle-life baldness and alopecia areata.

Baldness of middle life extends backward from the forehead, or begins at the vertex. The scalp is smooth and shiny, and the follicular openings are no longer visible.

Alopecia areata occurs in round, oval or serpigenous patches, the hair on other parts of the scalp being preserved.



B—Annular syphiloderm (I. E. Atkinson).

The surface of these patches, unlike syphilitic patches, are smooth and polished, and of a yellowish-white color. They are not scaly and are completely destitute of hair.

Secondary skin eruptions to be considered are the macular, papular, pustular and pigmentary.

The macular eruption upon the body is the first to appear but, unfortunately, rarely if ever is seen above the collar line and, therefore, of little diagnostic value unless the patient can be stripped for examination.

It may be said, however, of the macular eruption, that later in the disease (second or third year, when the lesion is really maculo-papular) it is prone to recur. It is then called the relapsing annular or circinate eruption, and is limited to certain localities. It appears upon the chin, the upper lip, around the nose, and between the eyes. When these rings, which may be broad or thin, sometimes enclosed within larger rings, are seen, the observer should at once recognize that his patient is in active syphilis.

The papular eruption is prone to attack the face and can be readily observed. The eruption consists of distinctly circumscribed, firm, solid, nodular, elevated lesions, varying in size from a pinhead to a pea. The nodule may be round or flat; in color it first appears bright red, which soon changes to brownish or purplish red and gradually fades. When mature, the papule is covered with a dry, tense, shining skin surface.

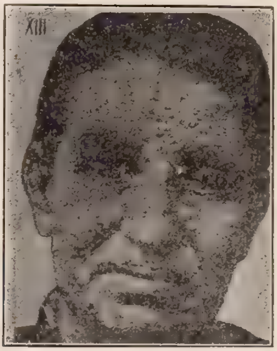


Fig. 13.—Small flat papular syphilide of the face.

The eruption may appear almost confluent between the nose and the corners of the mouth. When appearing on the brow, near the border of the hairs of the scalp, the papules often surround themselves with a delicate collarette of dirty scales. This grouping is called the "corona veneris" or crown of Venus.

The papular eruption may be divided into miliary, lenticular and papulo-squamous.

The miliary papular eruption appears rapidly in the form of minute, conical or pointed projections, the size of a pinhead or millet seed, grouped in circles or segments of circles, each group consisting of ten to forty lesions. The efflorescent spots invade the face, neck, back and shoulders. The eruption is at first bright red, gradually fading to a brownish-red, and leaving, after the disappearance of the papule, a bluish stain. During the early stage each papule may be surmounted by a minute vesicle which, upon drying, leaves a scale.

There are a number of lesions of non-syphilitic origin with which this form of the papular eruption may be confused, but those likely to come under the observation of the dentist will be considered only, namely, psoriasis punctata, and scabes.

Psoriasis punctata frequently appears upon the hairy scalp and ears, the papular eruption rarely. The desquamating scales of the syphilitic lesion consist of thin yellowish layers which never become confluent; the scales of psoriasis become confluent. Syphilitic papules do not coalesce but are coherent at their base and covered with small scales; the surface of psoriatic patches is more or less uniformly covered with large flaky scales.

Scabes is accompanied by acute itching, the macular eruption never. The excoriations caused by violent scratching in scabes is absent in the papular eruption.

The lenticular papular eruption is characterized by rounded or oval, flatly convex, sharply defined borders, and is slightly elevated. The color, at first bright red, later assumes a burnished or coppery hue. As the papule advances, the surface becomes shiny and red, breaks in the center and desquamates, forming an epidermal fringe around the periphery. Desquamation may take place several times; the papules become flatter and finally disappear, leaving brownish or bluish-gray spots of pigmentation, which are persistent. The distribution of this syphilide may be over the entire body, but the location to be considered is the region about the forehead and nape of the neck.

The papulo-squamous eruption is characterized by a thickening of the superficial layer of the skin with marked proliferation of the ephemeral elements. There is an accumulation of epidermic scales which rest in place, forming a scaly covering. The scales are of a dirty, grayish tint, dry, thick, and unusually friable. Sometimes they are hard, horny, compact and closely adherent. The squamous tendency being apt to manifest itself upon the face, along the eyebrows, chin, naso-jugal furrow, it is well for the dentist to be more or less familiar with its appearance.

Both the lenticular—especially in the late relapsing stage, when the eruption appears as large scaly papules—and the papulo-squamous eruptions may assume the aspect and configuration of psoriasis.

Psoriasis has large scales, lustrous, of a silvery or whitish appearance, distinctly imbricated, which are freely produced and shed. When a psoriatic patch is denuded, there is presented a reddish surface with a number of hyperemic bleeding points.

The syphilitic eruption is crowned with small scales which are thicker and less abundant than is psoriasis, and often do not entirely cover the lesion. When the scale is detached from the papule, there is revealed a circular neoplastic infiltration, elevated at the border, dry and of a reddish-brown or coppery color.

Psoriasis of the scalp occurs in the form of isolated or confluent patches, covered by an accumulated mass of mortar-like scales, while the syphilitic lesion in this locality is more apt to be pustular in character and covered by scabs.

Seborrhea may be mistaken for the syphilitic eruption when the latter is covered with yellowish, greasy, epithelial scales, but differs from it inasmuch as the greasy scales are brownish, and crusts may form large enough to mat the hair to the head. Unlike the denudation of the syphilitic lesions, when seborrhic scales are removed there is left a slate colored mildly inflammatory surface. When situated upon the face, the sebaceous ducts are seen to be enlarged and filled with matter.

The pustular eruption varies in size from a pin point to a dime, and may assume different forms. The majority of lesions are circular, many are oval, and each rests upon an inflamed base. Fortunately, the pustular eruption is rarely seen, but its occasional appearance justifies its consideration. The pustules begin as papules, which soon soften in the center and fill with fluid. When the pustule breaks a scab is formed. The scab of the large pustule becomes greenish-black, that of the small pustule greenish-brown. The crusts adhere tenaciously. The removal of the small crusts shows a papule with a point of ulceration, while under the scab of the large pustule is found an ulcerating surface with a grayish color, covered with dirty yellow pus.

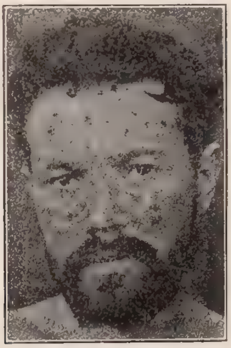


Fig. 14. Pustular syphilide

Of the many varieties of the pustular eruption the one for our consideration is that presenting small lesions. It is really a papulo-pustular syphilide, appearing frequently upon the face, neck and scalp.

It consists of small, conical, or slightly rounded pustules, which may form the entire eruption, or may be accompanied by papular lesions. The color of the base of the pustule is at first bright red but rapidly becomes brownish-red. The apices of the pustules are first yellow, but the pus is soon changed into a greenish-brown, somewhat adherent, crust. The pustules leave small brownish spots of pigmentation, which disappear in a few months. Should the pustules attack the hair bulbs and destroy them, permanently, alopecia results. The small papular eruption (papulo-pustular) may be mistaken for acne.

Acne differs from this eruption in that it is an inflammatory process, marked by varying degrees of localized heat and redness. Acne follows blocking of the sebaceous glands and, unlike the syphilitic eruption, is irregularly scattered over the face and neck. Blackheads are interspersed and the angry red bumps attain a maximum degree of inflammation and remain at that stage for months. Under the stimulation of increased inflammation there may appear at the apex of each hard bump a small dirty grayish or yellowish point, and if inflammation further increases the central portion of the papule may break down, suppurate and form pus.

The pigmentary eruption may appear both early and late in the secondary period. It is most likely to be seen on the neck, less frequently on the face, and occasionally upon the forehead.

The pigmentary syphilide, in the form of patches, consists of round, oval or irregular plaques, which may have sharply defined indentated or jagged borders. Their color varies from a light brown to a deep brown tint. They are unaffected by pressure and the condition of the circulation. In persons of light and delicate skin they may be very faint in tint, and perhaps only perceptible in an oblique light.

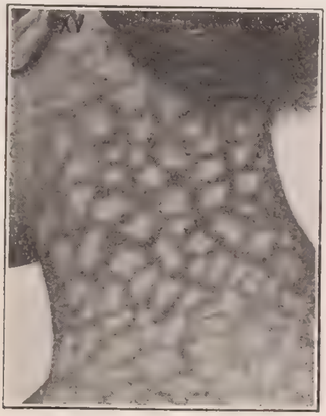


Fig. 15--Pigmentary syphilide.

The pigmentation may be uneven, sometimes the color being much more deep at the margins. Commonly there is no involvement of the intervening skin, though by contrast it may seem whiter than normal. The spots may remain unchanged for months.

The second form, pictured herewith, usually appears upon the neck. The patient often gives the history that he noticed or was told, that his neck was dirty. Then again the patient may think that his neck has become browner than usual, appearing as a plain surface, without intermingling of white spots. Later, this plain brown surface changes to a marble or mottled condition, characteristic of the lace or retiform variety of the pigmentary syphilide.

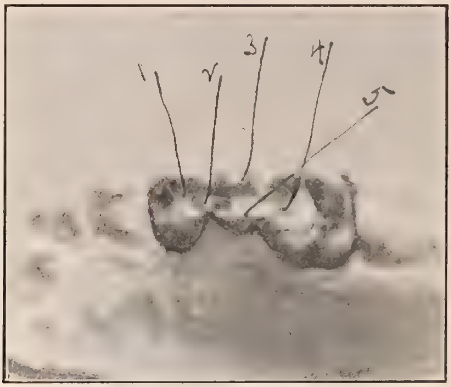
(To be Continued.)

A man who dares waste an hour of time has not learned the value of life.—Charles Darwin.

INLAY AND INLAY ATTACHMENT FOR BRIDGES.*

By C. M. Brooks, D.D.S., Bradford, Pa.

In this case the second bicuspid was supplied by an inlay in the mesial surface of the first molar holding the tooth, supplied with a bar resting in a depression to fit the bar in the inlay in the distal surface of the first bicuspid. No gold showing. Live pulp.



1. Inlay in bicuspid.
2. Half round bar resting in inlay.
3. Supplied bicuspid attached to molar inlay.
4. Molar inlay.
5. Molar inlay supplied tooth and half round bar one piece.

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*Clinic of Lake Erie Dental Society, 1911.

TIME SAVER IN CROWN WORK.*

By J. W. Roper, Ph. G., D.D.S., Princeton, Ind.

Prepare tooth and fit band as you would in any other method, then soften a small piece of Dr. L. P. Davis' metalline carving compound over a flame, press it into the band, have patient bite, then chill the compound, remove band and trim compound to the inner margin of band, finish carving the cusps, refit on tooth and have patient move jaw as though masticating, so by this method you can get the proper articulation. Remove and make impression of cusps in warm dental lac, chill and swage cusps, then solder to band and your crown is ready to be polished and cemented on the tooth. Try it and see how much time you can save. I use a Coates swager because the unvulcanized rubber will not split your gold in swaging.

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*Clinic at Indiana State Dental Society, 1911.

AN INLAY ABUTMENT FOR SMALL BRIDGE.*

By R. A. Chattin, D.D.S., Richmond, Ind.

will protrude with the upper front teeth striking on top of the lower, and the patient will say "This is the way I always close," when you and I know it is no such thing. How often have we noticed that after finishing an upper set of teeth, on placing it in the patient's mouth, we find the bite wrong. We do not find his chin protruding now, but in almost every case the mouth is closed correctly, and we realize that nothing can be done but take another impression and do it all over.

Taking advantage of this fact, the following method occurred to me, and as I said before has been, with me, satisfactory in every case.

The bite is taken in the usual way, and set up on the articulator. I then make a wax base plate and set up the two front blocks as is indicated by the bite. Soften a piece of modeling compound and mould over wax base plate, on palatal surface, and over alveolar ridge to give firmness to

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*Read before the Virginia State Dental Society, 1911.

Case, lost superior lateral, remaining or adjoining teeth sound. Prepare a cavity, after having devitalized the cuspid in the mesial-lingual portion, cutting a step well over to the distal. Set post in canal, also small post of platinum anchor-screw wire in hole drilled in bottom of step near to the distal. Wax up case with posts attached and cast. Seat inlay and proceed as in any other inlay. Use either Steele's interchangeable or ordinary pin facing. The second pin or post gives much additional strength and stays the inlay from pulling away from tooth toward mesial side. The principal advantage of this style bridge: strong, neat, non-irritation of gums, very little gold showing on labial surface.

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*Clinic of Indiana State Dental Society, 1911.

AN ACCURATE METHOD OF TAKING THE BITE IN FULL UPPER DENTURES.*

By C. E. Harper, D.D.S., Danville, Va.

My idea in preparing this paper was not to tell anything wonderful, but simply to state a method that with me has never failed to produce the desired results. It may be, and doubtless is, nothing new to a great many of the members of the Association, but if I can assist one fellow practitioner in this trying and uncertain operation I will feel fully repaid for the effort put forth.

We all know the trouble we experience in taking the bite. So simple a thing as telling a patient to shut his or her mouth immediately causes confusion, and out goes the chin. If we say, "Now close the mouth naturally," not one in a hundred can or will do it correctly. You ask a patient with natural teeth to close naturally, and the chances are the chin the base plate. The base plate, together with the teeth previously set up, is then tried in the mouth, and if the bite is found correct the set is finished. If on the other hand, it is found that the chin protruded when bite was taken, remove the base plate from mouth to articulator, and place a roll of soft wax just inside of the two blocks on palatal surface of base plate, then replace in mouth, and using the teeth previously set up as guide, the patient is instructed to bite, the lower teeth making an impression in the roll of wax. It is then removed from mouth to articulator, the articulator is loosened and the model of the lower teeth is set in the imprints in the roll of wax. The articulator is then securely fastened, the roll of wax is removed, the two blocks reset to correspond to the new bite. It is then tried in the mouth again, and if correct the set can be finished with the absolute certainty that the bite at least will be correct in the finished case.

RESTORATION OF FRACTURED ROOT BY THE CASTING METHOD.*

By J. Maurice Crosby, D.D.S., Bradford, Pa.

Remove the fractured portion of the root, attach a handle to the outside with wax, or better, drill and tap labial surface of fractured portion and attach a piece of German silver anchor-screw wire. This forms a very secure and convenient handle. Oil the inner surface of the fracture. Make a stiff mix of plaster into which press the fractured part of root, inner side downward, to get an impression. When set hard remove carefully. Immerse the impression in water and fill with wax, restore contour of labial surface. Remove and cast. Adapt to the root in the mouth with the crown post in proper position. Wax the inlay to post while in the mouth. Remove, invest and solder post to inlay. Replace in mouth and finish with band and cap as for Richmond crown, or a half band fitting the lingual surface may be made of wax in the mouth; remove with inlay, post, and cast to same.

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*Clinic of Lake Erie Dental Society, 1911.

A METHOD FOR CASTING BACKINGS FOR ALL-PORCELAIN FRONTS FOR CROWNS AND BRIDGES*

By D. Haight, Coshocton, Ohio

Take any of your old cast-off facings or broken plate teeth that have no pins, of any shade that will suit the case, or a Steele facing, and grind flat like a Steele facing. Grind it on the cutting edge as sharp and thin as you can. Grind off the cutting edge to be supplied the same length you would grind the porcelain for a gold tip. Take a knife-shaped carborundum stone and cut a groove lengthwise about the depth of a Steele facing, having the walls parallel. Take inlay wax, shape it as you want your backing, and have a good tip on cutting edge, for these are the secrets of success; then remove and cast. After it is cast cut serrations in the gold lug with a knife-edge carborundum and cut little under-cuts in groove. See that your facing fits perfectly to the backing. When you use for bridge or crown work, just before you invest, be sure and use antiflux so that no solder will run where your facing goes. I find Harvard cement the best for cementing the porcelain to the backing. I have had perfect success with this work for over fifteen years. By burnishing platinum on facing, the same as porcelain filling process, but since the process of casting, it is much more simple. In case of breaking one out another can be ground in without taking off the bridge.

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*Clinic at Ohio State Dental Society.

METALLINE IN CROWN AND BRIDGE WORK*

By Thomas M. Lea, D.D.S., Bowling Green, Ohio

The use of metalline is indicated whenever it is desired to get an accurate, normal reproduction of a cusp or a bridge case. The steps are as follows:

FOR A GOLD CROWN

Having prepared the tooth, fit your band carefully, being sure it is carried well under the free margins of the gum. Then take a stick of metaline and heat enough to cover the surface of the tooth and band; while warm place it upon the tooth and band and instruct patient to close the teeth very firmly, being sure he gives the normal occlusion.

While teeth are closed chill the metalline thoroughly, then using care remove the band with metalline from the tooth. Warm a knife or suitable instrument and trim the excess metalline from the band. Then insert the metalline cusps to edge of band in swaging cusp. Cool, and after removing metalline, cut gold, swage and solder cusp to band.

IN BRIDGE WORK

In bridge work it is necessary in a bridge of more than two teeth to make a die and counter-die from the metaline. This can be done at your laboratory bench after your facings are ground, backed and waxed in place, the metalline being trimmed to cusp shapes. By using metalline one is able to reproduce perfectly the normal bite, which gives much better satisfaction to the operator and benefits the patient in adding to the forces of mastication to a greater extent than in the ordinary swaged cusp.

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*Given as a clinic at Ohio State Dental Society.

If you haint the nerve to try
Sneak away somewhere and die.

A PRACTICAL METHOD OF USING SMOOTH BROACH IN ROOT CANAL TREATMENT*

By F. R. Van Meter, D.D.S., Cincinnati, Ohio

By using a small high-speed motor run by dry cell battery, the rapidly revolved broach enables one to wrap the desired amount of cotton accurately and uniformly, enabling the operator to go to the apex, even in extremely small canals, without danger of forcing the broach through and beyond the cotton so carried.

The thoroughness with which this work can be done, even in cases which would be extremely difficult or even impossible by the old method of hand wrapping, will appeal to those careful operators seeking the best possible results in this class of cases.

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*Given as a clinic at Ohio State Dental Society.

INTERCHANGEABLE BICUSPIDS AND MOLARS.*

C. M. Trotter, D. D. S., North Salem, Ind.

FOR CROWNS

Prepare the root as for a Logan, cutting small groove labiolingually across prepared surface to serve as a guide in setting the crown. Insert 16-gauge iridio-platinum pin, allowing it to extend high enough to become thoroughly incorporated in the wax. Select a diatoric tooth that will approximately fit the root, and fill all undercuts with cement, or fill with porcelain and fuse. Adjust a band matrix to the root. Lubricate both the root and the tooth. Fill the matrix with warm inlay wax and force the tooth into position, having the patient close until properly articulated. Remove the whole case from the root, remove matrix from wax and trim wax with tooth in position, leaving a rim extending well up around the tooth. Remove tooth from wax, leaving pin in position, invest and cast. After casting, fit tooth into cast base and try in mouth. Remove from mouth and cement tooth to position, when the crown is ready to set.

If the technique is thoroughly worked out, this crown will fit perfectly and make an ideal abutment.

FOR DUMMIES

Using any kind of abutments the operator may select in position on the articulator, select a diatoric tooth to approximately fit the case. Fill all the undercuts with cement or porcelain and fuse it. Grind the tooth until properly articulated, leaving plenty of space between the ridge-lap and the ridge to give room for the backing. Lubricate the tooth and build a wax backing, pushing the wax inside the tooth and allowing a rim to extend well up around the sides. Remove wax, invest and cast in the usual way.

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*Clinic at the Indiana State Dental Society, 1911.

The tooth is now placed in the cast backing and waxed to position on the articulator. If gold crowns are used for abutments, allow the wax to extend along the mesio-lingual angle to the cusp. Remove tooth from backing and cover entire case with investment. When set remove from articulator and carve away the model side of the investment until the ridge-lap of the backing is exposed. Burn out wax and the case is ready to solder. If careful in waxing the mesio-lingual angle of the crown, the bridge will be securely attached to the cusp, which brings the force of occlusion on the cusp. Cement the tooth into backing and the bridge is ready to set.

CAST JOINTED LOGAN CROWN.*

By C. J. Burris, D.D.S., Washington, Ind.

The jointed Logan crown is by no means new, but is perhaps being used more since the advent of casting. It is especially advantageous in cases where from decay or otherwise the tooth structure has been lost to an extensive degree beneath the gum line.

After the tooth root has been prepared as in cases for the Logan, select a removable pin crown with due regard to size and shape and grind to a joint beneath the gum line on the labial surface only. Then by use of an iridio-platinum pin join the two parts with inlay wax and press to place against the tooth root. Remove and trim away the surplus wax, replace and burnish wax around the tooth root. The crown can now be separated from the pin and wax and the latter invested and cast preferably by the use of pure gold.

This method gives increased strength to the pin as well as the adaptation to the root surface; the parts can now be united with cement and when finished is ready for setting.

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*Clinic at Indiana State Dental Society, 1911.

A SANITARY LATHE.*

By F. M. Sparks, D.D.S., Rushville, Ind.

Take a piece of 26-gauge galvanized iron six inches in diameter, draw a circle in center 1¼ inch in diameter, punch hold in center that will accommodate screw in end of chuck. With pencil divide into eight equal parts, take plate shears and cut on pencil lines to the circumference of small circle, and with cold-chisel cut out every other blade, twist blades to an angle of about twenty degrees and screw tight on chuck.

This gives you a fan that when placed on the opposite side of lathe from which you are using will blow all dust away from you. If you wish to use fan on right side of lathe, twist blades of fan to left.

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*Clinic at Indiana State Dental Society.

ALPHABETICAL LIST OF DENTAL LAWS, RULES AND REQUIREMENTS

By Alfonso Irwin, D.D.S., Camden, N. J.

1. Alabama—Law.
2. Alberta—Law.
3. Algeria—Requirements.
4. Argentine Republic—Rules.
5. Arizona—Law.
6. Arkansas—Law.
7. Australia—Law.
8. Austria—Requirements (Med. M. D.)
9. Belgium—Law Med. (Degree M. D.)
10. Bolivia—Requirements (Medical).
11. Brazil—Requirements.
12. British Columbia—Law.
13. British North Borneo—Requirements.
14. Bulgaria—Law (Extracts), Sanitary.
15. California—Law (Extracts).
16. Canada—Law.
17. Cape Colony—Extracts Law (Med.).
18. Chile—Requirements.
19. China—No laws.
20. Colombia—Law.
21. Colorado—Law.
22. Connecticut—Law.
23. Congo Free State—Requirements.
24. Costa Rica—Requirements.
25. Cuba—Requirements (Medical Law).
26. Delaware—Law.
27. Denmark—Requirements.
28. District of Columbia—Law.
29. Dominican Republic—Requirements.
30. Ecuador—Requirements.
31. Egypt—Regulations.
32. England—Law.
33. Florida—Law.
34. Formosa—Law.
35. France—Law Medical (M. D.).
36. Georgia—Law.
37. Guatemala—Requirements.
38. Germany—Trade Regulations (D. D. S. recognized).
39. Great Britain—Law (Medical).
40. Greece—Requirements.
41. Haiti—Requirements.
42. Hawaii—Law.
43. Honduras—No requirements.
44. Hungary—Requirements.
45. Idaho—Law.
46. Illinois—Law.
47. India—Tax license.
48. Indiana—Law.
49. Iowa—Law.
50. Ireland—Law.
51. Italy—Law, Med. (Degree M. D.).
52. Jamaica—Law.
53. Japan—Law.
54. Java—Requirements. (Netherlands—Law).
55. Kansas—Law.
56. Kentucky—Law.
57. Kongo Free State—Requirements.
58. Korea—Requirements.
59. Liberia—No law.
60. Louisiana—Law.
61. Madagascar—Law.
62. Maine—Law.
63. Manchuria—No law.
64. Manitoba—Law.
65. Maryland—Law.
66. Massachusetts—Law.
67. Mexico—Regulations, trade tax.
68. Michigan—Law.
69. Minnesota—Law.
70. Mississippi—Law.
71. Missouri—Law.
72. Montana—Law.
73. Morocco—No requirements.
74. Nebraska—Law.
75. Netherlands—Law, Medical (M. D.)
76. Nevada—Law.
77. New Brunswick—Law.
78. Newfoundland—Law.
79. New Hampshire—Law.
80. New Jersey—Law.
81. New Mexico—Law.
82. New York—Law.
83. New Zealand—Law.
84. Nicaragua—Law.
85. North Carolina—Law.
86. North Dakota—Law.
87. Norway—Requirements.
88. Nova Scotia—Rules.
89. Ohio—Law.
90. Oklahoma—Law.
91. Ontario—Law.
92. Orange Free State—
93. Oregon—Law.
94. Palestine—No restrictions.
95. Panama—Law (enforced).
96. Paraguay—Requirements.
97. Pennsylvania—Law.
98. Persia—No restrictions enforced.
99. Peru—Requirements.
100. Philippine Islands—Law.
101. Portugal—
102. Prince Edward Island—Law.
103. Porto Rico—Law.
104. Quebec—Requirements.
105. Rhode Island—Law.
106. Roumania — Medical law, sanitary regulations.
107. Russia—Medical requirements, M.D.
108. Saskatchewan—Requirements.
109. Scotland—Law.
110. Salvadore—No requirements.
111. Servia—Medical law, extracts, sanitary laws.
112. Siam—Requirements.
113. Straits Settlements—No ordinance.
114. South Carolina—Law.
115. South Dakota—Law.

116. Spain—Requirements, medical, M.D. degree.
117. Sweden—Requirements.
118. Switzerland—Law.
119. Syria—Permit.
120. Tasmania—Law.
121. Tennessee—Law.
122. Transvaal—Law, medical.
123. Texas—Law.
124. Tunisia—Requirements.
125. Turkey—Permit (law not enforced).
126. Uruguay—Requirements.
127. Utah—Law.
128. Venezuela—Law.
129. Vermont—Law.
130. Virginia—Law.
131. Wales—Law.
132. Washington—Law.
133. Wisconsin—Law.
134. Wyoming—Law.
135. Yukon—Requirements.

PATENTS AND PATENT LITIGATION OF THE DENTAL PROFESSION PAST AND FUTURE.*

By J. N. Crouse, Chicago.

I COME before you to discuss some very important questions relative to patents and patent litigation of the dental profession. A discussion along this line seems necessary at this time, because there are so many erroneous ideas in the minds of dentists on this subject. My past experience, I feel, places me in a position to speak with some degree of authority.

Among the questions which I wish freely discussed tonight are the following:

What is a process patent?

What constitutes a valid patent?

Should an individual dentist take out patents and enforce patent claims?

What is the duty of the Dental Protective Association of the United States toward patent claimants?

With these questions before you, I will now proceed with the discussion of our subject. Except it be the farmer, there is no group or body of men that has suffered more from patent abuse in the past than have the members of the dental profession. In order that you may understand and appreciate the truthfulness of this statement, it is necessary for me to give you some past history and describe the conditions surrounding us and the schemes for getting our earnings before the organization of the Dental Protective Association of the United States, in 1888.

In the year 1851 a patent was obtained by Charles Goodyear on the process of hardening or vulcanizing rubber. This patent was declared valid and was granted to the rubber company largely on its utility. The dental profession paid the royalty for the use of rubber for vulcanizing plates until this patent expired. Then the parties controlling this company took out another patent known as the Cumming's patent. This was nothing more or less than a patent on the different steps in making rubber plates with nothing new or original in it. A process patent pure and simple on which our profession had already paid royalties for the full term of the patent. Before attempting to collect royalty on this patent the rubber company secured a decision in the Federal court validating their claims. The validity of this patent was again tested in the Supreme court and it was proven that the rubber company had hired the attorneys on both sides, and this fact caused the Supreme court to remand this patent back to the lower courts for a re-hearing. An attempt was made to raise money to fight this in the lower court, but the dental profession was so demoralized and the lack of unanimity in the profession was so great, that nothing was accomplished and the rubber company collected royalty for seventeen years, or the life of the patent. It is a matter of history that many dentists went through bankruptcy to avoid paying the back royalty, and substituted celluloid for rubber, which in time proved a failure, and the practitioners of that period, some of whom are still living, paid the rubber company many millions of dollars and that on a patent which would not have been worth the paper on which it was printed if it had been properly tested.

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*Read before the Chicago Dental Society, September, 1911.

After the expiration of the Cumming's patent another corporation was formed known as the International Tooth Crown Company. The promoters of this company, seeing the favorable condition of the dental profession, they having been trained by the rubber company to pay royalty, and with the skill and experience which comes from long practice, were able to organize just the kind of a company to best secure the object desired and make the dentists do their bidding.

This company soon began giving the dentists the greatest annoyance possible. They had taken out and acquired patents — numbering from thirty-five to fifty — which covered all manner of operations and devices, making it impossible to practice dentistry without infringing many of their patented claims. And having in their employ the attorneys and former agents of the old Goodyear Dental Vulcanite Company, they were fully equipped to again yoke the dental profession and make them pay royalties in much greater amounts and by much more disgraceful methods than were practiced by the old rubber company. They were issuing licenses and bringing suits as early as 1886, and at this time had a number of dentists under injunction. Those securing these licenses were obliged to agree, in writing, to recognize the validity of all the patents owned and controlled by this corporation.

One of the various methods they adopted was to get clinicians appointed at society meetings to instruct and work up an interest in methods on which they held patents, also to employ instructors to go amongst the dentists and teach their patented methods. Then their agent following had more definite knowledge as to whom to approach as infringers. After securing as many licenses as possible in a town, the agent would, by way of reward to the victims, insert this notice in the local papers:—

DENTAL NOTICE

This is to certify that..............office No. .... street is our only licensee, to make and to furnish to patients in the city of.......... any tooth crowns or bridge-work, so-called, manufactured under the patents of the International Tooth Crown Company. Said patents are construed to cover the most practical forms of artificial dentures now commonly known as crown and bridge-work.

All persons are hereby cautioned against obtaining any such artificial dentures from any dentist not licensed, as none are authorized except by written license of said company.

The full legal penalty will be promptly enforced against all dentists, as well as their patients, making unauthorized use of any such patented denture.

A reward will be paid by said company to persons furnishing it with any cases of bridge-work of one, two or more crowns or bridges made by any dentist not licensed by this company.

(Signed) INTERNATIONAL TOOTH CROWN CO.

By way of enforcing their scheme, suits were commenced against several of the prominent men in different cities. Before the Protective Association was organized a large number of suits had been begun. Nor was this all, as five or six other companies had been formed with numerous patents on various methods of practice. Suffice it to say that it appeared to me as though our peace, manhood and prosperity were threatened on all sides.

After much thought and planning the Dental Protective Association was first presented to the profession at a meeting of the Odontographic Society of Philadelphia, in December, 1888.

It must be remembered in this connection that the unsuccessful attempts in former years to get united action on the part of the profession made it more difficult to form this association, and the lack of encouragement and the urgent advice given me by leading minds to abandon the scheme would have discouraged a less hopeful individual. However, I kept on working and pleading with the dental profession all over the United States, and at the end of eight years I had succeeded in getting 6,000 dentists into the organization.

Long before this, however, the association had retained the services of Offield & Towle, a well-known firm of patent attorneys of Chicago, and had taken charge of the defense of different dentists who had been sued by the hundreds all over the United States, and succeeded in getting their licenses revoked and stopped the paying of their license fees, as a large number of the dentists were paying enormous revenues to the Crown Company. In several instances the royalties paid were as high as $400.00 or $500.00 a year, and in a few cases even more than that.

In the suit brought by the International Tooth Crown Company against Richmond and others the record shows that everything was shaped so that the decree would make the Low bridge patent the only legitimate patent and all other bridge patents infringements. This would have been hard to understand only for the fact that the International Tooth Crown Company had previously acquired the Low patent, consequently this patent was the chief one in contention, and the only one on which they had a court decree in its favor.

In order to get this decision of the Federal court, which had validated the Low bridge patent, reversed, we felt it necessary to take a large amount of testimony, which we did, taking the testimony of fifty-five witnesses, scattered all over the United States, from Maine to California, and all of these witnesses I saw in person and from them learned what they could give us in the way of testimony, before taking their depositions before a Master. In all instances, I was present at the taking of this testimony before it was presented to the Court. This testimony amounted to over 500 pages, closely written, and we succeeded in the end in getting the decision reversed and putting the Crown Company out of business.

Had the Dental Protective Association not been in existence and the individual dentist left to himself, he would be at the mercy of these patent sharks and every man practicing dentistry today would be paying hundreds of dollars in royalty on the crown and bridge-work they are making.

The history of the Protective Association would hardly be complete without adding that the Crown Company, after the association had tied them up and cut off their revenue, brought suit against me for damage to their business for $60,000.00 and six months' imprisonment. That move didn't scare me in the least, and I immediately issued another circular announcing my decision to continue my part. Some time after this a representative of the Crown Company came on to Chicago and tried to buy me by bribery. I did not set any price on myself, but they offered me a million dollars if I would let them win two or three suits and then advise the profession to settle.

Some years later when the fight seemed to be over, a member of the Protective Association in the East said he believed the suit could be won yet, if I quit. I said that I had quit as I had no more funds and the profession did not seem interested. This party took it for granted that I would not fight any further and Sheffield and his party got into Court and took testimony again and got the Court to reverse its decision and sustain the Low bridge patent.

I then issued a circular to this effect, that if the dental profession wanted me to do anything for them they must come forward and pay $10.00 for their membership fee and by this method I more than doubled the membership. With these funds I went into Court again and proved that the Crown Company had hired the attorneys on both sides, and when this was shown the Court again reversed its decision, knocking out the Low bridge patent. It will interest you to know that a bill is now pending in Congress to have the Low bridge patent reinstated, but we will not discuss this tonight.

Having disposed of the International Tooth Crown Company, we now come to the consideration of more recent patents, in which you are all vitally interested; viz., the Taggart patents for casting gold fillings and the like. This invention has revolutionized the practice of dentistry more than any other thing in my lifetime, and I am happy, as president of the Dental Protective Association, to be able to endorse what Dr. Taggart has done and recognize his inventions on their merits. After careful study and investigation of his different patent claims, I believe they will stand the test, and will be validated by the Federal court when the proper time comes; and having come to this conclusion it behooves me, on the part of the Dental Protective Association, to get Dr. Taggart into an agreement before his patents were validated, thus guarding our members from any possible abuse by the owners of these patents, should they leave Taggart's hands, and prevent the possibility of exorbitant royalties being exacted. With this end in view, after long and strenuous efforts, the present Board of Directors of the Dental Protective Association, consisting of Dr. C. N. Johnson, Dr. J. P. Buckley and myself, succeeded in effecting an agreement with Taggart and his attorneys which will absolutely protect the members of the association, both present and prospective. This agreement is a compromise measure and will certainly prevent a long line of litigation, and at the same time it is just and fair to both the present members of the Dental Protective Association and Dr. Taggart, and also to all members of the profession who desire to join the association.

Such an agreement as we succeeded in making with Dr. Taggart could not have been made with him on so favorable terms after he had his patents validated. Immediately after this agreement was obtained a circular was issued announcing the terms and the conditions upon which the profession could take advantage of it. Whether this agreement will accomplish what we anticipated will depend upon the individual members of the profession. After this circular was mailed many of the older members sent in their check for the required amount at once. Others hesitated because they did not seem to understand just what the Dental Protective Association was. In issuing this circular we overlooked the fact that fully four-fifths of the practicing dentists of today know practically nothing of what the Dental Protective Association has done and how much they individually have been benefited by its existence. When we stop to consider that patent litigation has been practically at a standstill for the past ten or fifteen years, it is not strange that the younger men of the profession should be ignorant of the work of the association. For this reason, in the first part of this paper, I have given you a brief history of the Dental Protective Association, showing how we put the International Tooth Crown Company out of business and prevented much patent abuse. You, therefore, have a faint idea of what you are being saved today in royalties because of this association. There is not a man practicing dentistry today in this country who is not being saved hundreds of dollars each year which he would have had to pay had these greedy corporations been left to their own designs.

There is one very important factor which I wish to discuss in this connection, and it is this: Not more than one-sixth of the dental profession came into the Dental Protective Association or contributed to the expense of this vast amount of litigation, yet the remaining five-sixths received the protection and benefits without paying a dollar. The only contributions many of these outsiders have made or are making today is their criticism of the association, mainly adverse and unfair.

When this Taggart proposition came up, and I had examined his patents and the evidence which will be presented to the Federal court, I studied it over carefully and came to the conclusion that Taggart would ultimately establish the validity of his patents. I felt that here was an opportunity for doing double duty. First, if an agreement could be effected it would be possible for Dr. Taggart to get a just revenue without court fights and without working a hardship on any man; and, secondly, it would place the Dental Protective Association on a strong and permanent basis. I knew that these objects could be accomplished only by means of a compromise agreement, making the terms so reasonable and fair to all parties concerned that each member of the profession would willingly join the Dental Protective Association to get the benefits thereof.

There are supposed to be about 40,000 dentists using Dr. Taggart's inventions in the United States alone. If this number came into the association, it is easy to see that a large fund of money would thus be created with a very light tax on each one. The income of such a fund, if properly invested, would take care of every form of abuse that might arise in the future and threaten the profession, and thus the permanency and efficiency of the Dental Protective Association would be assured.

One feature of this agreement is that to get the benefit of it, a dentist must be a member of the Dental Protective Association, and because of this fact I have been accused of coercing or trying to coerce members of the profession into the association. Any dentist who feels thus loses sight of the fact that were it not for the association no such agreement could have been made with Dr. Taggart, for it was not a voluntary act on his part, and it now seems only just that the members of the profession who have been reaping the benefits of the association without contributing to its support, should come forward and do their part in this great work. If they do not, and let me state plainly here that there is absolutely no compulsion about the matter, but those who do not choose to join with us must stand, so far as the Dental Protective Association is concerned, on their own responsibility; and if sued by Dr. Taggart and forced by law to pay what might seem to be an unjust amount, they have only themselves to blame. This paper is presented at this time that every member of the profession may have knowledge of the fact that through the Dental Protective Association's agreement with Dr. Taggart they may have the advantage of all of Dr. Taggart's inventions without paying unjust or exorbitant royalties, unless it can be construed that the payment of 88 cents a year in advance for seventeen years, the life of the patents, for this privilege is unjust and exorbitant.

This agreement provides first, that any member of the association in good standing can secure the present Taggart machine for the cash sum of seventy-five dollars ($75.00), including the permission to use the method, providing the amount is paid within one year from the date of the entry of any decree or judgment finding Taggart's patents valid or granting damages for infringement, or he can obtain permission to practice the Taggart method alone for the lifetime of the patents (17 years) with any machine he may now be using for the cash sum of fifteen ($15.00) dollars, providing the amount is paid before the entry of any decree or judgment finding Taggart's patents valid or granting damages for infringement.

The agreement further provides that any member of the profession who joins the association within the time above specified can also secure such permission on the same terms.

The fee for membership in the association is ten ($10.00) dollars. It may be seen that for twenty-five ($25.00) dollars any member of the profession can obtain membership in the association and the permission to use the Taggart method. We feel that this is a fair and just proposition for all concerned, and we earnestly hope that all of the members of the association, both present and prospective, will accept the terms of the agreement.

Those who know anything about Federal court proceedings will appreciate the fact, that it may be only one month or it may be four or five years before Taggart's case comes up in Court for final adjudication, and the members of the profession must understand that there is nothing to prevent Dr. Taggart and his attorneys from bringing suits against dentists who are using the methods with infringing machines without first obtaining the right to do so, either directly from him or through the Dental Protective Association. On this point there seems to be a great deal of misunderstanding. The profession is in error in thinking they need not take action until Taggart has validated his patents. There is nothing to hinder his lawyers from bringing as many suits as are advantageous to their cause at any time.

I wish to emphasize distinctly here that any member of the profession who is sued by Taggart cannot thereafter take advantage of the agreement, for the Protective Association is barred from furnishing them any assistance in the way of defense and they will be obliged to deal with Taggart and his lawyers independent of the association. Some such suits have already been begun, one right here in Chicago, where the party sued had to go and settle with Taggart and his lawyers for a much larger sum of money than the sum specified in this agreement.

As this agreement was a compromise measure, it would be much easier to comply with this than to take the chance of being sued, and it is hoped that the members of this society will set the example and comply with this agreement as a body.

There is another mistaken idea which seems to cling to many members of the profession, and that is, that process patents cannot or should not be valid. Many are asking why, since I fought and did away with certain process patents in the past, do I not take this process patent of Taggart's and treat it similarly. What is to hinder other process patents being thrust upon us, they ask? These questioners lose sight of the fact, that here are patent claims which in the opinion of good judges will stand the test in Court because they are legitimate and based on the well recognized principle that for a thing to be patentable, it must be new and useful. Let me ask, What is a process patent? I can think of hardly a patent that does not involve a process. What constitutes a valid patent then? There is no more well established principle relating to patent law than that the thing patented to be valid must be new and useful. The essential elements of utility and usefulness are the basis of our whole patent system and the statutory enactments thereunder. It is often difficult, and at times impossible, for the patent office to determine simply from an examination of the thing presented for a patent grant whether such thing is a new and useful improvement. As a matter of fact the patent office is unwilling to assume the responsibility of determining whether the elements of newness, usefulness and improvement in the thing presented actually exists. Therefore, many patents are granted which are neither new nor useful and must come under the head of worthless patents. It was largely such patents as these which in the past annoyed the dental profession.

You may ask, Is Taggart's invention new and useful? Some men claim to have done these things before Taggart. Granting for sake of argument that they did, which I am certain in my own mind they did not, let me ask, did these men give the ideas to us so that we might make use of them? Is there any man present who really doubts but that for Dr. Taggart we would still be filling teeth in the old way? Is there any one here who is willing to give up the method given us by Taggart in every detail, and practice as he did before? I do not believe there is a man here tonight who would willingly give up the use of Taggart's method and fill teeth as he did before it was known for one hundred times what Taggart has offered to accept by the terms of the Dental Protective Association's agreement.

In answer to those who seem to lack confidence in the ability of the officers of the Dental Protective Association to determine valuable from worthless patents, and fear that the latter might be recognized in the future, let me say this: If anyone presents a patent based on the principle of being new and useful, they will be given due consideration and an opportunity offered for treating the members of the Dental Protective Association fairly. This is just what we did with Dr. Taggart, and let me say to his credit, that he was willing to be fair. What more could we ask? The association in the future, as in the past, will endeavor to protect its members, but its members only, from abuse. If this can be done by compromise, all well and good; if not, the association will exhaust its funds in attempting to protect its members. This is one of the strongest arguments for the existence of such a fund as we hope to create, for no sane man or group of men would attempt to abuse the members of any organization if he or they knew that a large sum of money was ready to be expended if necessary to prevent such abuse.

Since announcing to the profession the terms of the agreement with Taggart, I have been accused of not doing my duty because I did not fight Taggart and try to invalidate his patents. Why should I have fought Taggart when he was willing to treat the members of the Dental Protective Association fairly? I have always posed as an honest man, and no honest man would fight Taggart under the circumstances. Surely, I would not as long as he attempted no abuse of the members of the association. Some, who do not understand the situation and who seem more willing to criticise than to put their shoulder to the wheel and help, say that the Dental Protective Association was organized to fight all patents — good, bad and indifferent. Since I organized this association myself, I ought to know the objects of its organization, and I know of no better way of stating this to you than to quote from the second circular that was issued to the profession in June, 1889, over twenty-one years ago. In this circular I said:

"Its first object, as stated in the circular, is to defend the profession against the unjust demands of patentees whose claims are worthless. Let it be distinctly understood that it is not the design of the Dental Protective Association to interfere with any man's legitimate business or valid patents, but to stop the enormous abuse of dental patents.

"Its second object is to bind the dental profession together for mutual protection, strength and helpfulness, with a bank account and without politics.

"An organization for defense must necessarily differ widely from one for social or political purposes. It must be ready for war at any moment. To insure this, the authority needs to be in the hands of a few. Such an organization is the Dental Protective Association. The power is invested in the directors; the responsibilities are borne by them, and all risks as well. They can sue or be sued, are accountable for the proper handling of funds, and must take charge of the suit of any member of the association who is unjustly sued for infringement. Every member by paying a fee of ten ($10.00) dollars and assuming a liability of ten more, only (which latter will probably not be needed), can continue his practice undisturbed, knowing that if sued he will be furnished with the best of legal talent and evidence, and be relieved of all costs and harassment of suit. It will at once be seen that the largest expenditure of the association must be that of time, energy and thought on the part of the directors, since there are no salaried officers, and expenses are kept at the minimum.

"The first and greatest adversary, though not the only one, with which we have had to deal, is the International Tooth Crown Company. Do you know how nearly you have been in its jaws? Look at a list of its patents. On bridge-work it has several, including the Low, the Richmond, and the Sheffield bridges. It has patent on preparing roots for crowns, which includes a patent on freezing the tooth, a patent on cutting off the tooth, a patent on killing the pulp, and on driving it out at the same time (if you can), a patent on filling the end of the root, and a patent on filling the root with material suitable for holding the metallic pin or screw which supports the crown or bridge.

''It had even a patent on the cement for securing crowns. On crowns it has many patents, including the Beers or gold crown, the Bitner crown, the Richmond crowns and the Sheffield crowns; several of each of the last two named. It has patents on crowns with bands and without bands; patents on crowns secured with screws and without screws; a patent on crowns secured with gutta percha, a patent on crowns secured with cement, and a patent on crowns secured with both gutta percha and cement. It has also a patent on crowns covering the end of roots. In fact, if the validity of these various patents owned by the International Tooth Crown Company should be established, it would seem as if all the other crowns now in use would be declared an infringement on that company's crown patents. Then this company has also a patent on use of trial plates, a patent on getting articulating models, and a patent on investing the piece for soldering.''

I quote the above simply to show that the accusations against me at this time are absolutely incorrect. I have uttered these sentiments time and time again during the past twenty years, to-wit: *that the Dental Protective Association was not organized to deprive a man of his rights,* and in this instance, after examining the patents which Dr. Taggart now holds, I am more and more convinced that the Court will in due time validate them; and in all the discussions I have heard I have had but two men say he was not entitled to at least the small sum of fifteen ($15.00) dollars as compensation.

In this paper I have abstained from discussing the question of ethics in relation to patents or the propriety or wisdom of dental inventors taking out patents, except to say that there is no reason why an inventor should not be compensated for his inventions, and the only way for him to get compensation is to patent his discoveries, and the proof of this assertion is well illustrated in the present case. In this connection I wish to call attention to a very able article in the September number of the *Dental Review,* by Dr. Edmund Noyes, wherein the subject is treated exhaustively and ably and which should be read by every dentist.

Ever since the organization of the Dental Protective Association I have, at various times, been accused of all sorts of unwarrantable acts. I have been criticized alike by the companies which I was fighting, and by many members of the profession on whose behalf I was making the fight. Sometimes I have answered the criticisms and sometimes I have not, because I have felt confident at all times that my acts would eventually be judged by the results, and I was willing to stand or fall by this test. Then, again, I knew that much of the criticism was based on a misunderstanding.

This I feel is especially true of the agreement in the Taggart case, and my present plea is that men will look carefully into the merits in question before passing judgment. I have never claimed to be beyond the possibility of mistakes, because to be that I would be something more than human: and yet in this Taggart agreement I have had ample time to think it over, and I do not believe that any mistake has been made. In any event, I am willing to await the verdict of time and experience, and I have little doubt of the ultimate endorsement by my profession of the position I have taken.

In order to give something like a comprehensive review of the past and present patent litigations, it has been necessary for me to omit the discussion of patents on celluloid or aluminum and many other unimportant patents, as this paper is already unusually long. I hope you have not been wearied to such an extent that you cannot enter into a thorough and earnest discussion of the questions involved. I thank you for your patience.

MAN WHO USES INLAY METHOD VIOLATES NO PATENT

Washington, Nov. 14.—The District Supreme Court today dismissed a suit to enjoin a Washington dentist from using the Taggart method of inlay in filling teeth, thus settling a long continued litigation of highest importance to dentists throughout the country.

Although Dr. William H. Taggart, a Chicago dentist, was granted a patent on his idea, testimony was adduced showing that the inlay method had been used three years before application for patent was made by Dr. Taggart. No appeal was noted.

GLASS INSTRUMENTS AS BURNISHERS

By Newell S. Jenkins

The greatest recent improvement in porcelain work is in using glass instruments for burnishing the foil. Take a glass rod and warm the end over the Bunsen burner. When soft, stretch it out with pliers and then melt the point into a small ball. You can shape the shank as you like, only don't make it too slight. With these perfectly smooth glass balls you can, either in the mouth or on a model, burnish the foil to perfection. Even on a sharp edge you will not tear the foil, but you can go over it again and again until every fold and wrinkle disappears. With this burnisher you can carry the foil unbroken into the deepest part of the cavity, and when it is securely packed in the ordinary manner, remove the packing, hold the foil in position by a finger on the overlap and burnish. The light reflected from the glass is also an aid in an obscure position. The gold foil is made much stiffer by this method and peels off from the inlay with great ease. No method of stamping is to be compared with this, for you can far more easily and accurately use this method on a cement model than by stamping. I have never seen such perfect margins obtained in any other way. Dr. Weber, of Paris, introduced this method to the Paris Club. Do not neglect to familiarize yourself with it.—*Items of Interest.*

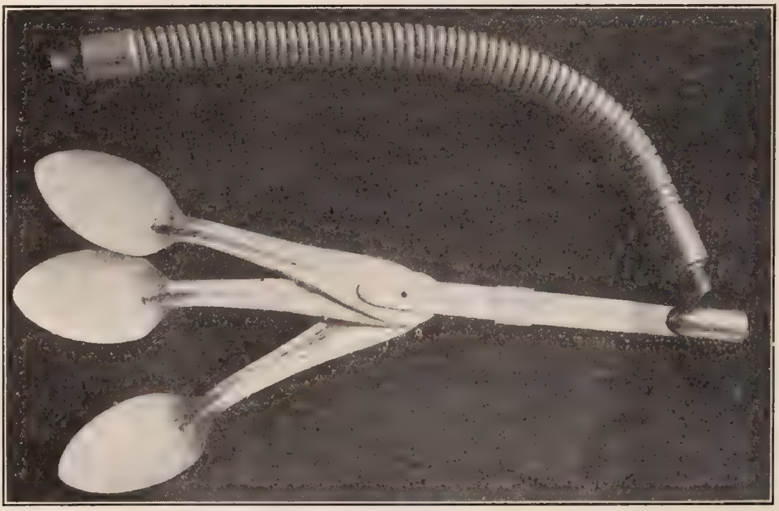
AMERICAN CIRCULATING DENTAL CLINIC

A SOLDERING DEVICE.

Dr. T. B. Ma Gill, Kansas City, Mo.

Screw the flexible arm on to the crown foot, then screw on the clamp-pliers; open pliers and insert the iron spoon (one or more). The pin in the pliers to go through the holes in the spoons.

Now any soldering which has to be invested can be invested in the bowl of the spoon. (Crown or Bridge.) Coarse investment is better as it is not so apt to blow up by heating too rapidly.



A soldering device, by T. B. MaGill

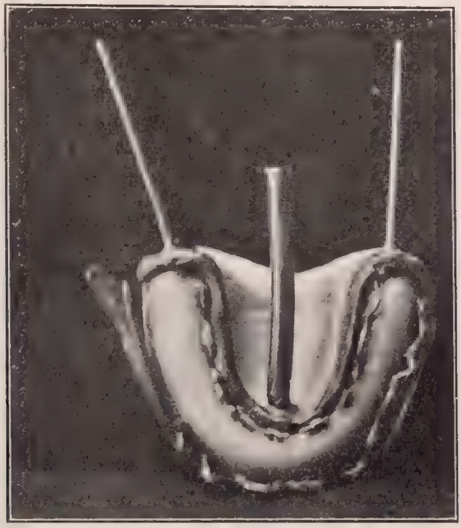
After case is invested the flexible arm can be adjusted high above a Bunsen flame and as it heats up bend down into flame. Use a very small amount of investment, a film 1-16 in. thick is plenty. The spoon holds it in shape, also distributes heat evenly.

To solder, place an empty spoon in pliers with one holding invested case. Place the solder in empty spoon. Another spoon may be adjusted for another karat solder or flux. Apply heat from beneath until case is cherry red, then apply solder and flame. By using flexible arm you can get to any part of investment with blow-pipe.

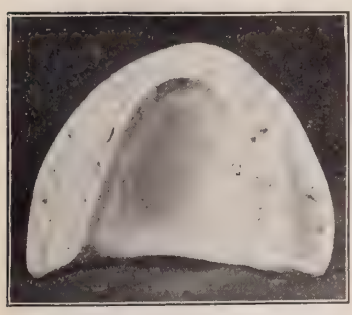
WILSON'S CAST ALUMINUM PLATES.

George H. Wilson, D. D. S., Cleveland, Ohio.

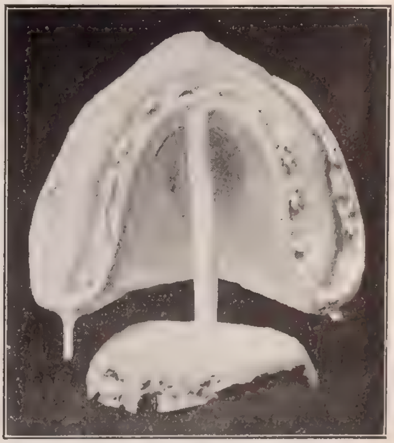
1.—Cast of silica sand, wash silica and plaster of Paris, equal parts by measure. Base-plate of paraffin built up with pure yellow beeswax showing stages of construction; also the sprue formers. The pouring sprue must not exceed 3-16 of an inch.



Waxed impression, showing method of waxing



Finished casting

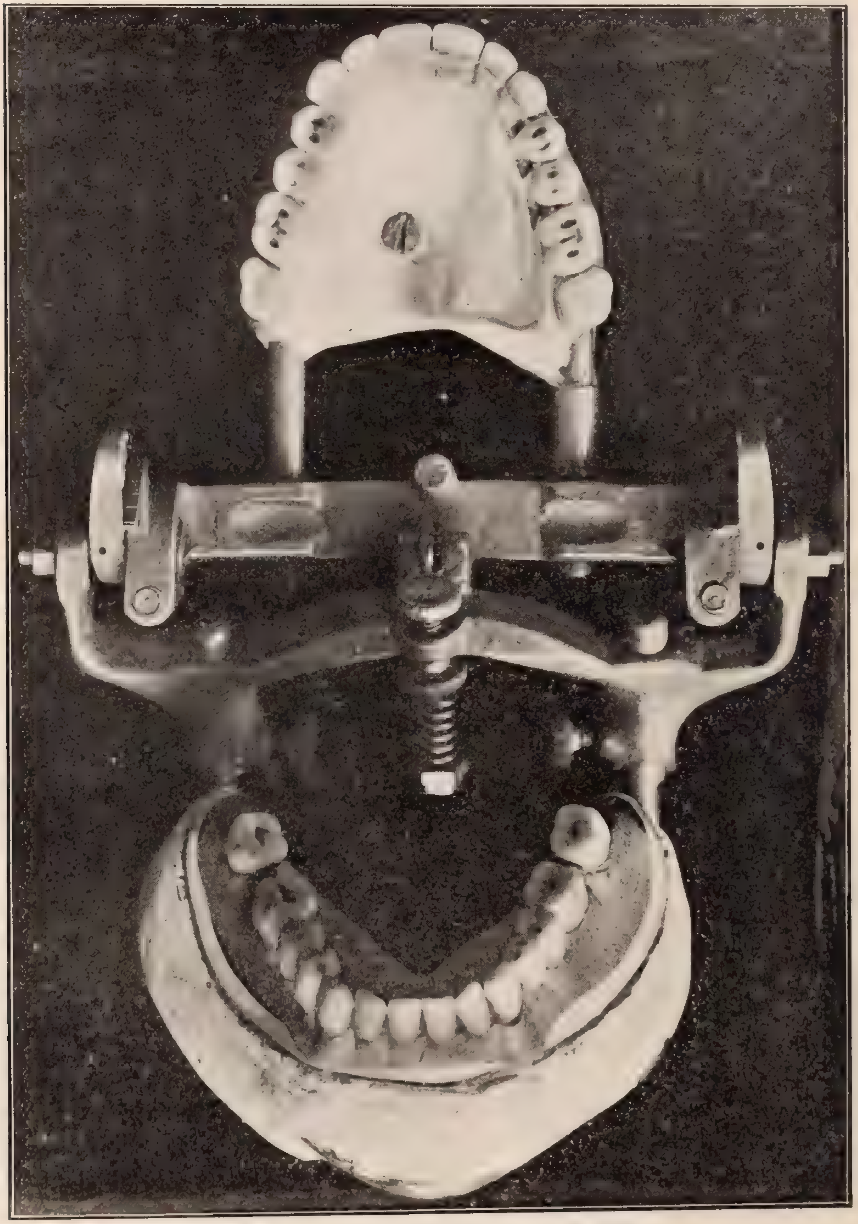


Casting as it came from investment

2.—Casting as made in the Billmeyer bucket.

3.—Finished pure aluminum base-plate.

4.—Complete denture mounted on Snow antagonizer. The upper is cast direct to the tooth. This is not practicable with platinum pin teeth, as aluminum is a solvent for platinum. Attachment of the teeth with vulcanite is the practicable and desirable method, as exemplified in the lower denture.



Showing aluminum cast to teeth on palatine surface

CAMPBELL'S COW-BELL METHOD OF CASTING PLATES.

Dayton Dunbar Campbell, Kansas City, Mo.

In describing this simple and unique method of casting aluminum plates, we will not go into the question of the superiority of the cast metal denture over one made of vulcanite, but give in a homely way the procedure in detail:

INVESTMENT MATERIAL

After taking your impression, coat it with your favorite separating fluid and *when dry rub* well with *soapstone* and pour with an investment compound after the formula originated by Dr. C. C. Allen, which consists of *equal parts* of *Portland cement* and *dental plaster.* This compound is in keeping with the simplicity of the casting machine, and in fact, is cheaper than plaster, sets very fast and is free from shrinkage and expansion, making an ideal compound in bridge work.

It is hardly necessary to say that the plaster and cement must be mixed dry beforehand, and so thoroughly that when patted down with a spatula no particles of plaster are distinctly recognized. To obtain the best results, this material must be worked thicker than plaster.

SEPARATION

On separating the impression from the model, if the former when poured is jarred down well, the model will present a finished surface. The part of the *model* the plate is to cover is now *rubbed* well with *soapstone.* This gives the model a metallic luster and a surface very desirable to cast metal against.

WAX

The model is now covered with a new, clean piece of common yellow *base-plate wax* and care taken that it is of *even thickness* throughout, and that it has not buckled on the ridge in the median line. The wax is now *trimmed* as you wish the *plate to be,* and care taken to cut it low where the depressor muscles have action, usually in the region of the first bicuspid. The *outer edge* of the *wax* is now *stuck* to the *model* all the way around with a dry, sizzling-hot spatula, held at a right angle with the wax. A *strip* of *wax* 3-16 of an *inch wide* is now cut lengthwise from a sheet of wax and *laid* down *flat* on the *wax* model even with the edge, except near the heel of the plate, where it is brought over to the lingual surface. The wax strip is brought as near the top or bottom of the ridge on the palatal or lingual surface as the case will permit, the idea being to do away with as much rubber as is possible. The outer sixteenth of this strip is now made a part of the wax model by thrusting a dry, hot spatula through the strips all the way around *until* the *model* is *felt* beneath. The surface next the outer border of the strip is now filled in with wax and smoothed up with a chip blower and alcohol lamp, care being exercised to leave the inner edge of the strip square. At this point lower the temperature of the wax, which has become soft by working, by dipping model and all in water that is not cold; then, with a dull instrument, *raise* the *inner border* of the *wax strip all the way round,* as is shown on right side of Model No. 1. It should be lifted away most near the canine eminence and the lingual border of the heel. If this is done right, it affords all the attachment necessary. Sometimes it would be impracticable to use the strips on the labial border; it can be done away with altogether, and for the attachment of the rubber, loops of German *silver* or *aluminum can be set in place* on the *wax* and *cast successfully.* Of course, there is no union of the metals, but they are held in place mechanically tight enough to serve their purpose.

If you desire to cast directly on the teeth, the front is left open for the pink rubber, and a space of one-half to one millimeter left between all the teeth. This is imperative, because the contraction of the alloy or metal used in casting the teeth would all be checked or broken off.

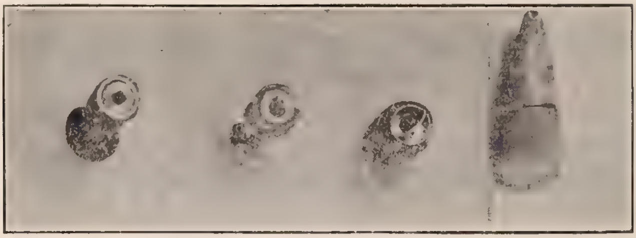
The model is now trimmed even with the heel of the plate and a little roll of wax, about the size of a slate pencil and about three inches long, is stuck on the model with a hot spatula, even with and joined to the wax plate. Don't lay this piece of wax over on the wax, as it will not facilitate casting, but will be difficult to remove in the cast.

A METHOD OF TREPHINING AND INSERTING BAND WITHIN CIRCUMFERENCE OF ROOT IN DIFFERENT FORMS OF DOWEL CROWNS.

S. N. Young, D. D. S., Cincinnati, Ohio.

To apply the band in connection with ready-made porcelain crowns, the following procedure is simple:

Remove the crown of the tooth and reduce the end of the root with stones slightly beneath the gum line, open canal with a round bur of same diameter as trephine guide, select from set a trephine of gauge desired, and which will reach to point just within the circumference of the root, at point nearest to root canal, sink the trephine into end of root deep enough that the furrow will guide the blade later on; now enlarge canal and shape it as desired, then with stones or facers finish shaping surface of root to



Figs. 1, 2, 3 and 4.

the point desired beneath the gum. Replace trephine in furrow and sink into end of root as deep as the band is desired to go in, about 1 mm. beneath root surface on labial. (See illustration.)

Now dry the end of the root and furrow, and having selected band of clasp-metal of same gauge as trephine used, from supply of bands on hand and which has been previously adjusted over the model over which the trephine has been "trued" (see Figs. 5-6), so that it will fit the furrow, same as the trephine does, cover the band with a quick-setting cement, press deep into the furrow, and hold for a few moments. When the cement has hardened sufficiently, remove surplus of band with stones, and the abutment is reinforced, ready for seating the crown. In an ordinary case with everything required at hand, this entire operation will occupy from three to five minutes' time.

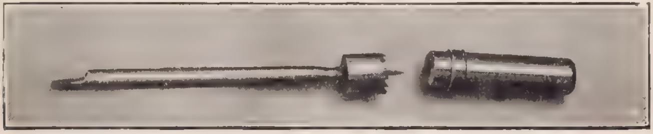


Fig. 5.

To apply in connection with plate and post crowns, prepare the root as above described. Select a band of clasp-metal or in this case crown plate gold can be used, if desired, place in trephine furrow and hold firmly; with a strong sharp instrument, mark the band distinctly at root surface, entirely around. Remove band and trim to this line, then readjust the band over the brass model if necessary; now select a piece of plate gold of karat and size desired, and adapt lightly to end of root, place the band in proper position in this plate and attach with a minute piece of solder, observing that the band is united all around.

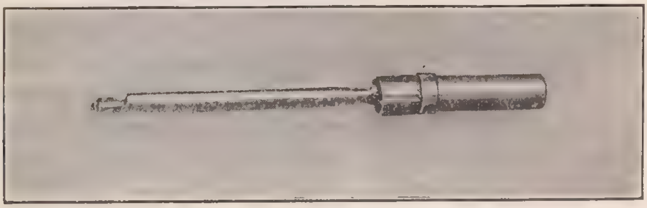


Fig. 6.

Place now the plate in position on root, hold firmly and with large foot plugger in automatic mallet, tap plate lightly around the circumference and mark outline of root upon under-surface of plate; remove and trim to outline. Perforate plate over canal for post, replace in position on root and force post into position, remove and solder post to plate with lower karat solder. Replace on root and go over again with foot-plugger to insure good adaptation to root surface.

A very artistic and substantial piece of work can be made by making this post and plate abutment, using S. S. W. or Justi detachable post and allowing end to project beyond surface of plate far enough that detachable crown can be adapted to it. The crown can be adapted to this abutment quickly at same sitting, or bite and impression can be taken and the crown adapted subsequently.

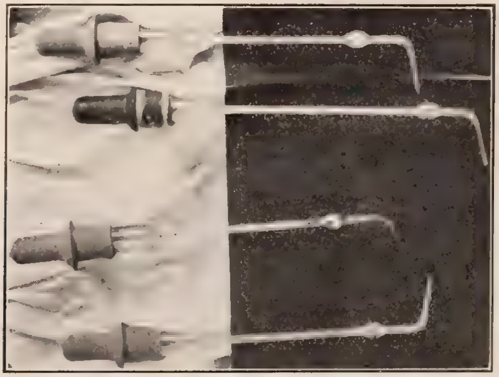
If pure gold has been used for the plate in this form, and a little fullness left in trimming, it can be burnished after the crown is set, thus protecting the cement in both crown and root.

Previous to setting the crown of the plate and post variety, a minute hole should be made in the band at its highest point, near the plate, to permit escape of excess cement.

SET OF INSTRUMENTS DESIGNED FOR PLACING MEDICAMENTS IN PULP CHAMBERS OF UPPER TEETH.

W. C. Stillson, D. D. S., Cleveland, Ohio.

The colors on the bulbs are for the purpose of differentiation (such as the green one) are to be used with the heavier liquids, e. g., phenol sulphonic acid. The tubes having smaller openings are to be used with the lighter liquids, e. g., alcohol or eucalyptol.



Set of instruments for placing medicaments in pulp chambers of upper teeth

They are especially indicated in the use of sulphuric acid, as there is no chemical action on the glass similar to that on steel instruments. They are very delicate and should be handled with great care.

CAST GOLD CROWN

By E. R. Kibler, D.D.S., Indianapolis, Ind.

The making of a cast gold crown is one of the easiest of operations, and at the same time we obtain the nearest approach to perfection in occlusion, contour, fit at the cervical and contact. The technic of the method

I use is as follows: After preparing the root take a piece of 32-gauge gold and make your band and fit it to the tooth, clip the occlusal end of the band and turn it in, so it will fit the root at the occlusal end of the tooth. The object of this is to have your occlusal end smaller than the cervical in casting so your gold will cast all the way down. Then solder the flat piece of gold across occlusal. This will allow your crown to return to the exact position after casting. Then melt your inlay wax on the occlusal surface of the crown and return to tooth. Have patient bite, remove and melt the excess of wax around the sides of crown for contour, then carve the wax and reproduce the original tooth as nearly as possible.

DENTISTS INTERESTED IN A COURT DECISION

SUIT DISMISSED TO ENJOIN THE USE OF INLAY METHOD OF FILLING TEETH.

(Franklin, Ind., Times, Nov. 21, 1911)

Dentists throughout the United States are interested in the action taken by Chief Justice Claybaugh of the Supreme Court of the District of Columbia in dismissing the suit brought to enjoin the use of the Taggart method of casting inlays in the filling of teeth. The Court assessed the costs of the proceeding, which involved the taking of testimony in various parts of the country, on Dr. Taggart and the surety company which qualified on his injunction undertaking.

In January, 1907, William H. Taggart, a Chicago dentist, was granted a patent what was supposed to cover a new method of filling teeth, without the unpleasantness accompanying the hammering in of the gold filling. Dr. Taggart also invented a machine for facilitating the use of his method. The patent on the machine was not involved in the suit.

With the sale of the machine was granted the right to use the method, and when Dr. Taggart learned other dentists were practicing the same method in repairing the teeth of their patients he brought a test case against George W. Boynton, a dentist of Washington. The suit asked for an injunction, accounting and damages.

Attorneys Mason, Fenwick and Lawrence, representing the local dentists in the pursuit of evidence to offset the claim of Taggart, discovered dentists and teachers in dental schools who had been teaching and practicing the inlay method more than twenty years before the application for patent by Taggart. When the case was called before the chief justice, counsel for Dr. Taggart did not press the suit and the order of dismissal with costs was entered.

Attorneys Dyrenforth, Lee, Chritton and Wiles appear of record for the plaintiff.—Washington Star.

This patent covered Dr. G. B. Martin's method of cast gold crowns, bridge and inlay work, as testified by more than a score of dentists that he taught them this method in the Indiana Dental College and Indianapolis Post Graduate School of Dentistry, and that he as well as themselves had used it in their practice for fifteen to twenty years before Dr. Taggart got a patent on it, and that Dr. G. B. Martin gave his method of cast gold work to the profession in 1887.

CORRESPONDENCE

NEW YORK LETTER

November, 1911.

The meeting of the First District Dental Society of New York was held the evening of November 6th, this being the second meeting of the allied Dental Socieities of New York city, namely: The First District Dental Society, the New York Odontological, New York Institute of Stomatology, and the New York Institute of Dental Technique.

By the union of these societies it is hoped to make the First District Dental Society a more powerful and potent scientific body and have it take its position as the leading dental society of America.

The work of the various sections has been enlarged and new sections added, so that the First District Society starts this year with well-organized sections in Orthodontia, Crown and Bridge-work, Porcelain and Gold Inlays, Pyorrhea Alveolaris, Hygiene, Oral Surgery, and a section in Stomatology and Dental Research.

The prospectus of the various sections shows that the several chairmen have not only gone outside of the dental profession in order to get the instruction in the various subjects under study, but have borrowed the experts from among the dentists of distant cities. From this it is evident that the several chairmen will give their classes varied and expert instruction on all subjects.

At the first meeting in October, Dr. W. V-B. Ames of Chicago read a very good paper on "Oxyphosphate Cements." In describing the properties of the different cements, he pointed out that frequently it was an advantage to mix the powder of one manufacture with the liquid of another, the success of course of such digression depending upon the knowledge of the properties of each powder and liquid. The paper at the November meeting was "Dental Disease as It Effects the Mind," by Henry S. Upson, M.D., of Cleveland, Ohio, and was discussed by such able alienists as Charles L. Dana, Frederick Peterson and Luther Gulick, all of New York city, and J. Madison Taylor of Philadelphia, and continued by many from the dental profession, among them being Dr. E. J. Darby of Philadelphia and Dr. M. I. Schamberg of New York city. The general weight of this most excellent discussion was to the effect that while Psychosis, although not necessarily due to dental trouble, yet often cases have been both relieved and cured by the proper treatment of accompanying dental disease; and furthermore, the dental disturbances need not be of an elaborate degree. There is much food here for thought for every dentist today, and a more interesting field of research has not for years been opened — a field on which the medical and dental scientist can work together.

If the First District Society but continue to have presented such valuable, interesting and scientific papers, it will have a season of which it can indeed be proud.

W. C. F.

DR. TAGGART LOSES SUIT

DR. W. H. TAGGART entered suit in the Supreme Court of the District of Columbia on July 12th, 1908, against Dr. George W. Boynton, for using the disappearing wax method in making gold inlays, for which Taggart had been granted a patent, without having been granted a license by the said Taggart. The District of Columbia Dental Society, determining to defend Dr. Boynton, one of its members, appointed a committee of defense composed of Drs. John H. London, Wm. Donnelly, Wm. N. Cogan, Henry C. Thompson, and M. F. Finley, who immediately took up the matter and issued a circular letter to the profession, sending out thirty-five thousand such circulars. December 16th, 1908, Dr. O. H. Simpson, the first witness for the defense, was brought to Washington, D. C., to give testimony, and from then on until January 30, 1910, the defense put other witnesses on the stand, covering the entire United States from New York to California.

The plaintiff, dilatory in taking rebuttal testimony, was by order of the Court in December, 1910, forced to close his case, sixty days being allowed by the Court to complete same. The defense then took up the matter of sur-rebuttal testimony and re-direct, finally closing that side of the case on July 22d, 1911.

On October 16th, 1911, in the Supreme Court of the District of Columbia, the defense joined issue with the plaintiff and the case was duly calendered. On November 13th, 1911, Chief Justice Harry N. Clabaugh of above Court rendered the following decision:

"SUPREME COURT OF THE DISTRICT OF COLUMBIA

William H. Taggart, Complainant,
vs.
George W. Boynton, Defendant.
In Equity No. 27927

Present, the Honorable
Harry N. Clabaugh,
Chief Justice.

At a stated term of the Supreme Court of the District of Columbia, holden at the Courthouse in said District, on the 13th day of November, 1911.

The above cause, being regularly upon the calendar and coming on to be heard and the Court having heard counsel, it is this 13th day of November, 1911,

HEREBY ORDERED, ADJUDGED AND DECREED, that the said cause be and the same hereby is dismissed, and it is further

ORDERED, ADJUDGED AND DECREED that the defendant, George W. Boynton, do have judgment against the complainant, William

H. Taggart, and his surety the Pacific Coast Casualty Company of San Francisco, for his costs and disbursements herein, to be taxed by the clerk.

By the Court. (Signed) HARRY N. CLABAUGH,
Chief Justice."

A glorious victory for the profession against an iniquitous suit, on a process as old as time, which the defense clearly proved by many witnesses as well as by the records of the U. S. patent office.

The National Dental Protective Association is an outgrowth of the committee of defense, and is prepared to defend its members against all similar suits, but does not intend to defend those who are not members. We feel that we have the necessary machinery in working order to take care of our members against any and all such attempts to throttle the profession.

M. F. FINLEY,
Chairman Committee of Defense.

COMPLIMENTARY BANQUET TO DR. WILBUR F. LITCH

A testimonial banquet will be tendered to Dr. Wilbur F. Litch on the evening of December 16th, 1911, at the Hotel Walton, Philadelphia, Pa., on the occasion of his retirement after fifty years of dental practice.

The committee, representing the Philadelphia Dental Club and the Stomatological Club of Philadelphia, is desirous of having this information reach all of the friends of Dr. Litch, and they make the announcement in this way so that any who do not receive a formal invitation from the committee may have the opportunity to attend.

The subscription price of the banquet is $10.00, which may be forwarded to the treasurer of the committee, Dr. Edwin T. Darby, 1701 Locust street, Philadelphia, Pa.

OBITUARY

DR. HORATIO MERIAM, D. M. D.

Died, in Salem, Mass., July 27, 1911, of heart disease, in his 67th year, Horatio Meriam, D.M.D.

Dr. Horatio Meriam was born in Tewksbury, Mass., March 20, 1840. He was educated in the public schools of that place and Lowell and then went into the office of Dr. Gerry to prepare himself for his chosen profession.

In 1870 he entered the Dental School of Harvard University, continuing there that year until 1871. He then studied in the office of Dr. Batcheler of Salem, re-entering Harvard again in 1873 and graduating in the class of 1874.

In the fall of 1874 he established an office in Salem, when he built up a large practice and practiced continuously for 37 years.

During the years 1884 to 1885 he was chemical instructor at the Harvard Dental School and from 1885 to 1889 instructor in operative dentistry.

At the time of his death Dr. Meriam was the oldest active practitioner in point of practice, belonging to the Essex Dental Association. He was a man who combined the practical with the ideal and was highly esteemed and looked up to by all the members of his profession. He was much interested in the welfare and progress of his profession, belonging to many societies: The Harvard Alumni, the Harvard Odontological Society, American Academy, Massachusetts Dental Society, Essex Dental Association, Lynn Dental Society, New York Stomatology Society, and honorary member of the Great Britain Odontological Society. He was also much interested in civic and social affairs, belonging to the Essex Institute, Massachusetts Reform Club, and Horticultural Society.

He was a great lover of flowers, in the study and cultivation of which he passed many of his hours outside his professional duties.

Dr. Meriam was married to Edith Worcester of Salem, Sept. 12, 1878, who, together with five sons, survives him.

RESOLUTIONS

WHEREAS, In the demise of Dr. Horatio Meriam the Almighty, in His infinite power and wisdom, has seen fit to remove him from our ranks, and

WHEREAS, He was a beloved brother member of our Association from its inception; and

WHEREAS, By his death the community and members of our profession have lost an earnest citizen, a zealous and untiring exponent of all the best principles of our profession, always teaching us the practical as well as the ideal side, and ever ready to cooperate in any movement for the advancement of the profession; therefore be it

Resolved, That the Essex Dental Association deeply deplores his death and extends its sincere sympathy to the members of his immediate family in their bereavement; and be it further

Resolved, That a copy of these resolutions be spread upon the minutes of this Association and a copy mailed to his family.

Committee on Resolutions:

E. O. Richards, D.D.S.
W. G. Fanning, D.D.S.
M. C. Smith, M.D., D.D.S., D.M.D.
F. E. Jeffrey, D.M.D., President.
F. E. Rice, D.D.S., Secretary.

DR. JESSE ROBBINS, D. M. D.

In the demise of Dr. Jesse Robbins, one of the oldest and most highly esteemed members of our Association as well as one of the oldest practitioners in New England, the Almighty in His infinite wisdom has removed from our ranks a beloved brother member to other fields beyond, after a career of untiring interest in everything pertaining to his profession.

Dr. Jesse Robbins was born in West Bromwich, England, on Feb. 28, 1845. After having come to this country he studied dentistry in the dental department of Harvard University, whence he was graduated in 1871.

He established himself in Salem, Mass., and up to within the last few years has there successfully practiced his chosen profession. His interest in professional and civic affairs is evinced by his membership in the original staff of the Salem Hospital and in the Essex Dental Association, of which he became a member soon after its formation.

He was married to Elizabeth Gibson of Salem, Mass., in 1869, who, together with one son, Fred G. Robbins, also a dentist of Boston, survive him.

RESOLUTIONS

WHEREAS, In the demise of Dr. Jesse Robbins the Almighty, in His infinite power and wisdom, has seen fit to remove from our ranks a beloved and highly esteemed brother member; and

WHEREAS, He has been a member of the Essex Dental Association since Nov. 17, 1910; and

WHEREAS, By his death the community and members of our profession have lost an earnest citizen, an eminent and highly esteemed member who through his career has always lived up to the best tenets of his profession, its welfare and progress; therefore be it

Resolved, That the Essex Dental Association deeply deplores his death and extends its sincere sympathy to the members of his immediate family, in their bereavement; and be it further

Resolved, That a copy of these resolutions be spread upon the minutes of this Association and a copy mailed to his wife and son.

Committee on Resolutions:

E. O. Richards, D.D.S.
W. G. Fanning, D.D.S.
M. C. Smith, M.D., D.D.S., D.M.D.
F. E. Jeffrey, D.M.D., President.
F. E. Rice, D.D.S., Secretary.

NEW PUBLICATIONS

A Manual of Dental Prosthetics. By George H. Wilson, D.D.S., formerly Professor and Demonstrator of Prosthetics and Metallurgy in the Dental Department of Western Reserve University, Cleveland, Ohio. 12mo, 507 pages, with 396 illustrations. Cloth, $4.00 net. Lea & Febiger, Publishers, Philadelphia and New York, 1911.

This volume is the first of a new series of medium-size text books and reference works covering the main departments of dental science and practice.

A mere announcement of the publication of this book should be sufficient, for Dr. Wilson's extensive study, investigation and teaching in this branch, together with fifteen years devoted exclusively to the practice of prosthetics, has thoroughly fitted him for the preparation of such a work.

Those who are acquainted with Dr. Wilson know that he is thorough in everything that he undertakes, and the contents of this manual show the same careful preparation that characterizes his everyday work. In five hundred pages he has covered his subject thoroughly in all its aspects—theoretical, practical and esthetic.

It is a book that every dentist, old or young, should read and study, for no one can read it without gaining many valuable suggestions that can be applied to his everyday practice. It will serve admirably as a text-book and as a guide to the dentist wishing to post himself on any detail or on the latest developments.

The text is admirably illustrated with 396 illustrations and the paper, printing and binding are excellent. It is a book that every dentist should own.

Essentials of Operative Dentistry, with Illustrations. By W. Clyde Davis, B.S., M.D., D.D.S., Dean and Professor of Operative Dentistry and Technique, Lincoln Dental College, associated with the University of Nebraska, Lincoln, Nebraska. Published by the author, 1911.

The author states that in the preparation of this text-book his aim has been to meet a demand in dental college work for a treatise on operative dentistry which is sufficiently condensed for the student to master its contents in the comparatively short college terms at his disposal.

The subject matter selected is that which is generally taught by the instructors styled as "Professor of Operative Dentistry."

The text is admirably condensed and tells the reader the "whys and wherefores" and how to do things. It is thoroughly practical and includes the best methods by the best men in the profession.

The subject matter is considered in a progressive manner, and the author sticks to the subjects he is treating. There is no verbose language in the book and in the 166 pages of text an immense amount of valuable matter is presented, and the teaching is up-to-date.

While the work is intended primarily for the student, it is a book that dentists generally can study with profit.

Notes on Dental Anatomy. By T. W. Widdowson, L.D.S.,Eng. Late House Surgeon to the Liverpool Dental Hospital. Author of "The Care and Regulation of Children's Teeth." London: John Bale, Sons & Danielsson, Ltd., Oxford House, 83 Gt. Litchfield street, London, W, 1911. Price, five shillings net.

A SPRAY BOTTLE CONTAINING

LISTERINE

IS ONE OF THE MOST DESIRABLE ADJUNCTS
TO THE DENTAL CABINET EQUIPMENT

THERE is no other antiseptic available that is comparable to Listerine in those pleasing characteristics of odor and taste which make its use so agreeable to the patient while securing for the practitioner the antiseptic influence that may be required.

An ex-president of the American Dental Association, writing to the manufacturers of Listerine, says: "The more I use Listerine the better I like it. I use it after any surgical operation in the mouth as an antiseptic wash, prescribing Listerine one part, water ten to twenty parts. After nearly all protracted operations in the mouth, I offer as a gargle and mouth-wash twenty to thirty drops of Listerine in half a tumbler of water, and find that it leaves the mouth in a delightfully cool and pleasant condition, and promotes healthy granulation of lacerated or bruised tissue."

THE DENTIST'S PATIENT

A leaflet designed to convey useful information respecting the care of the teeth. Supplies of this interesting treatise on oral hygiene are furnished free of expense to dental practitioners for distribution among their patients. A specimen copy, together with an order-form, will be sent upon request.

LAMBERT PHARMACAL COMPANY
LOCUST AND TWENTY-FIRST STREETS, ST. LOUIS, MISSOURI

Be assured of genuine Listerine by purchasing an original package

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AN IDEAL APPARATUS FOR GIVING

Nitrous Oxid { WITH AIR
WITH OXYGEN
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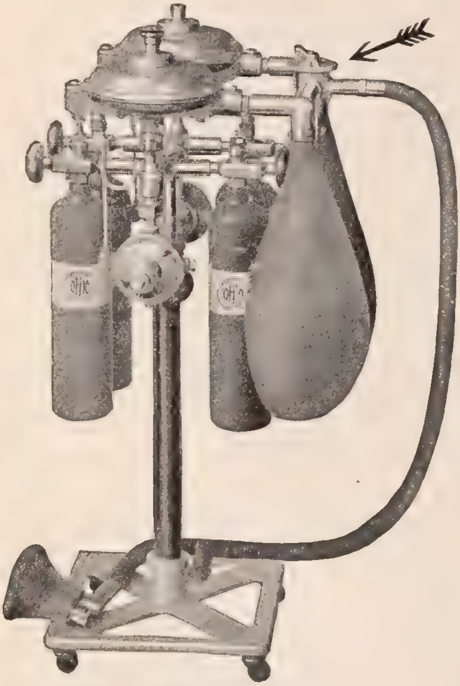
EXTREMELY SIMPLE *to* OPERATE
Works upon new principles, and is *noiseless.*



PATENT APPLIED FOR

As the gas passes thru the machine the pressure is automatically reduced, so that the flow and the combination with Oxygen is completely controlled by one valve; it is therefore called the "Monovalve."

For ordinary dental operations an assistant is not necessary to administer the anesthetic.

Write for further information and mention your dealer's name.

Are You Using

Ohio Nitrous Oxid and Oxygen?

The purity of the gas will be noticed thru its pleasant effect and prompt action. Insist that your Dealer supply Ohio Gas

The Ohio Chemical & Mfg. Co.

1183 Marquette St., Cleveland, Ohio

This work constitutes, to a great extent, an abridged "Tomes," to which has been added the most important theories, etc., of other authorities upon the subject.

The author states that the book is intended for use in conjunction with *Tomes' Dental Anatomy, Hopewell Smith's Histology and Patho-Histology of the Teeth*, the same author's *Dental Microscopy*, and *Howard Thompson's Comparative Dental Anatomy.*

The book contains about 130 pages, one-half being devoted to human dental anatomy and the other half to comparative dental anatomy. The subject matter is well presented and blank leaves are distributed through the text for use in making additional notes.

Haskell's Manual of Plate Work; or, Hand-book for the Dental Laboratory. By Loomis P. Haskell, D.D.S., formerly member of the Faculty of the Chicago College of Dentistry, later of the Northwestern Dental College and organizer of the Haskell Post-Graduate School of Prosthetic Dentistry; professor Emeritus of State Dental College of Texas. Revised edition. Chicago, 1910. Published by the author.

This little book is devoted exclusively to plate work and is a working guide for those who want, in condensed form, simple and explicit methods.

The methods given are the best Dr. Haskell has found in his sixty-five years' experience in plate work.

Dr. Haskell has done a great work for the profession in elevating the standard of artificial dentures and dentists everywhere should show their appreciation for the man who has given the profession freely, and without cost, the methods that cost him years of labor to obtain.

No better testimonial of appreciation can be shown than by sending $2.00 to Dr.Haskell for this little book, and we urge *everyone* of our readers to order a copy from him.

Dr. Haskell has retired from actual practice and the sale of the book means much to him at the present time.

OTHER BOOKS AND PAMPHLETS RECEIVED

A History of the Swedish Dental Society. Published in connection with the semi-centennial of this society in November, 1910. 284 pages.

The Prevention of Dental Caries. By J. Sim Wallace. Published by *The Dental Record*, London.

Locket-Crown. By H. Leger-Dorez. Reprint.

Dental Materia-Medica and Therapeutics. By Hermann Prinz. Published by C. V. Mosby Co., St. Louis.

Metallurgy. By J. D. Hodgen. Published by C. V. Mosby Co.

Dental Formulary. By Hermann Prinz. Pub. by Lee S. Smith & Son Co., Pittsburg

American Text-Book of Operative Dentistry. By E. C. Kirk. Published by Lea & Febiger, Philadelphia.

Modern Dental Materia-Medica, Pharmacology and Therapeutics. By J. P. Buckley' Published by P. Blakiston's Son Co., Philadelphia.

SOCIETY·ANNOUNCEMENTS

CHICAGO DENTAL SOCIETY CELEBRATION AND INSTITUTE OF DENTAL PEDAGOGICS

OUTLINE PROGRAM OF "DENTAL WEEK" IN CHICAGO

CHICAGO DENTAL SOCIETY

Monday. Jan. 22, 1912. (All day) Manufacturers' exhibit. Monday evening, 8 o'clock, "Comparative Dental Anatomy," Dr. William Bebb.

Tuesday, Jan. 23. (All day) Clinic—College of Dentistry, University of Illinois. Tuesday evening, 8 o'clock, paper, "Salivary Calculus," Dr. G. V. Black.

INSTITUTE OF DENTAL PEDAGOGICS

Wednesday, Jan. 24, 9 o'clock a. m., address of welcome, the Mayor of Chicago. President's address, Dr. Donald M. Gallie. Report of Master of Exhibits. Report of Commission on Text Books. Wednesday afternoon, 2 to 5 o'clock, paper, "The Teaching of Comparative Dental Anatomy," Dr. William Bebb. Wednesday evening, 8 o'clock, banquet (hotel not selected). Address by (prominent speaker of national reputation).

Thursday, Jan. 25, 9:30 to 11:30 a. m., visit Northwestern University Dental School. Luncheon, 11:30 to 12 o'clock. Automobiles to West Side. Visit Chicago College of Dental Surgery, 1 to 3 o'clock. Visit College of Dentistry, University of Illinois, 1 to 5 o'clock. Thursday evening, 8 o'clock, paper, "The Teaching of Dental Histology," Dr. Fred B. Noyes.

Friday, Jan. 26, 9 o'clock, "The Teaching of Applied Physics and Chemistry," Dr. Marcus L. Ward. Report of Commission on Nomenclature. Report of Dental Index Bureau; 1:30 o'clock, "Teaching of Clinical Pathology," Dr. H. T. Smith.

Virginia State Dental Society

The 43rd annual meeting of the Virginia State Dental Association will be held at Old Point Comfort, Va., July 9-10-11, 1912. All ethical dentists cordially invited to attend.

W. H. PEARSON, *Cor. Sec.*

The G. V. Black Dental Club

The G. V. Black Dental Club will hold a mid-winter clinic in St. Paul during February, 1912. Definite dates will be given later. Dr. R. B. Wilson, Secretary, American National Bank Bldg., St. Paul, Minn.

ACUTE INFLAMMATION

A patient applies for treatment with a jaw so swollen and painful that it is impossible to open the mouth sufficiently to make a proper examination, much less do any operating.

We are constantly receiving reports from dentists who have treated such cases with a thick hot dressing of Antiphlogistine, to find that in twenty-four to forty-eight hours the swelling and pain have so far disappeared as to allow of proper operative procedures.

But—"A stitch in time saves nine." Antiphlogistine used when the inflammation is beginning will prevent the serious condition pictured above.

Antiphlogistine
TRADE MARK

Manufactured only by
The Denver Chemical Mfg. Co.
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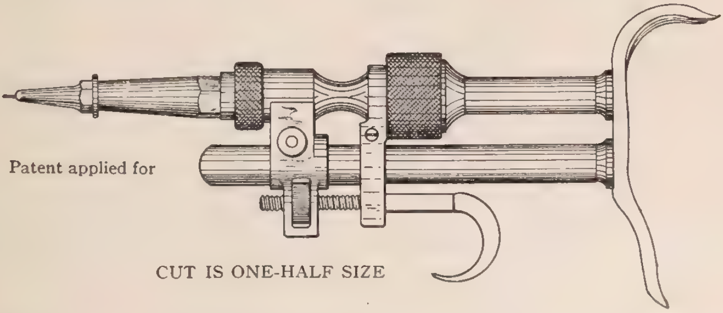

Patent applied for

CUT IS ONE-HALF SIZE

A New High Pressure Syringe

The Sapp High Pressure Syringe No. 2.
A screw piston syringe operated with one hand.
Every part adjustable. Ball bearing.
The most complete instrument for obtunding sensitive dentine ever invented.

PRICE $25.00

Order through your dealer or

DR. J. B. SAPP

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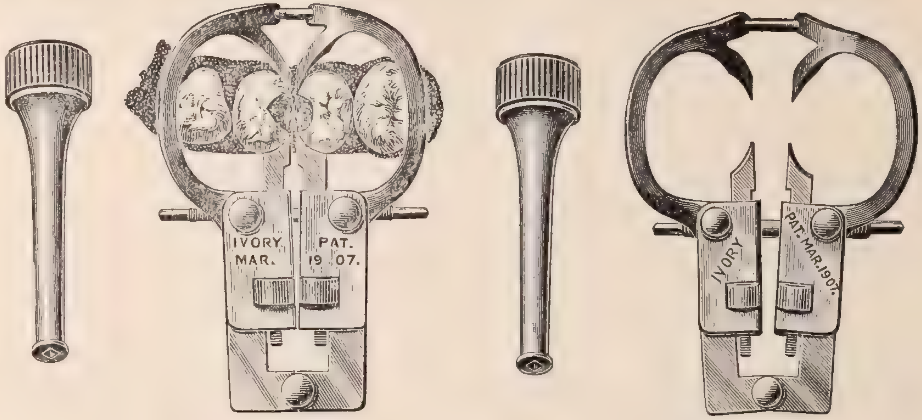
Cleveland, Ohio

Ivory's Adjustable Separator

Patented March 19th, 1907



THE jaws of each ½ of the separator working independently allows for the difference in the size of the teeth, gives a wide range for the adjustment of the jaws where the teeth are irregular, and a perfect control over the jaws so that they need never interfere or cover the margins of the cavity. The spreading force is many times slower than the ordinary screw force, no binding of the screw is possible, and its action is the most powerful screw force known.

Because the control of the jaws is completed, the movement of the spreading force so slow and evenly divided and the sense of touch perfect, the pain in separating the teeth is reduced to the minimum. It is universal for all operations extending beyond the first molars working on either side of the arch by changing the thumb nut.

PRICE FOR EACH $5.00

J. W. IVORY, 21-23 N. 13th St., **Philadelphia, Pa.**

NEWS and OPINIONS

"DOC."

Many years have come and vanished
Since I tortured my first patient
With my skill of doubtful value,
But believing it was priceless.
And I'm sitting here and thinking
Of that time of want and struggle,
How my courage waned and wasted,
And at last of the temptation—
How the great idea got me,
Made me see the way to riches.
And my days were filled with planning

Of the gorgeous advertisements,
Stuff that would attract attention
From the gullible and easy.
So I put in all the papers,
Both the ones of night and morning,
Large and flaming advertisements,
Telling of my painless methods;
Also of the big reduction
In the prices of the gold work.
Crowns were now to be three dollars,
Plates were two or three and upwards;

And I waited for my people.
Those of little wealth and learning,
They could pay their bills in quarters,
One each week would be sufficient.
For I was the "common people's
Greatest friend and benefactor,"
Wanting nothing for my labor;
'Twas for love that I was working—
And the victims flocked to see me,
Filled my offices o'erflowing,
So I had to make them larger,
Get more chairs and many helpers.
Years I ran along in this way,
Making dollars after dollars;
Also making of my patients
Enemies, who soon would get me.

I remember well the morning
When I came down to the office,
Found the marshal waiting for me
With a summons from "His Honor."
How I had to come before him,
Be arraigned there for malpractice.
And the charge they brought against me
Was a grave, a very grave one.
In it I was held neglectful
Of the proper care and caution
In my handling of "the lady."

Well, they found me guilty of this,
And they took from me my license,
Also fined me all the money
I could get and scrape together.
So I stepped from that old court room
Poor and with my youth behind me,
All my business gone and shattered;
And I thought then as I wandered
All alone towards my dwelling:
"Not a soul in all this city
Owes me aught but hate and malice."

I am waiting now the summons
From the Judge we all must answer,
And I'm wondering if he tempers
All the justice he dispenses
With the quality of mercy—
With the quality of mercy.

—CHARLES DAVIS.
1039 Third St., Milwaukee, Wis.

PUBLIC HEALTH IN WISCONSIN

Madison, Wis., Nov. 26.—In Wisconsin the diseases of humanity are fought by the same methods used by that state to eradicate political evils—educational campaigns among the common people. In this movement the state board of health utilizes every source of benefit. The secretary, Dr. C. A. Harper, a physician of broad experience, has naturally called to his aid the scientific skill of the University of Wisconsin. So the names of such men as Prof. W. D. Frost, Dean H. L. Russell and M. P. Ravenel, who first discovered by isolation of the bovine germ that tuberculosis could be transmitted from cattle to human beings, have become household possessions.

To diminish the loss of life in Wisconsin the state and the university have furnished the people with the evidences of tangible results obtained in a tuberculosis sanitarium, a Pasteur institute, and by the free distribution of anti-toxines for the treatment and prevention of diphtheria, typhoid and smallpox. The people are becoming thoroughly aroused through organization like the Wisconsin Anti-Tuberculosis Association, Anti-Fly campaigns, Societies for the Prevention of Infantile Mortality, Health Leagues and Sanitary Squads in every community—all supported by voluntary contribution.

A co-operation between all departments of government with the university and the people in an educational health campaign is Wisconsin's method of combating disease. And the people sustain the movement in the enactment of stringent laws because they have been educated.

Wrongs of the Poor.

Departures from the old way in things educational come in for hard raps, first and last, but not often are they assailed as in this letter which a glowering boy handed to his teacher the other day:

"Madim you kepe teling my son to breeth with his dierfram I sepose rich boys and girls all has dierframs but how about when their father only makes 2 dollers a day and theres 4 younger I tel you its enoug to make everybody socialists first its one thing and then its another and now its dierframs its too much."—P. R. Benson in Woman's Home Companion.

The Real Christmas.

In the December Woman's Home Companion, Dr. Charles E. Jefferson, pastor of the Broadway Tabernacle in New York, writes a great Christmas sermon. One of the eloquent passages in it follows:

"It is worth remembering that Christmas is the birthday of Jesus, the Man who never gave the world a dollar. He bestowed upon mankind not a solitary material gift. He carved no statue, painted no picture, wrote no poem, composed no song. fashioned no piece of jewelry, built no edifice, founded no city, erected no triumphal arch; but He stands in history as the great Giver. Silver and gold he had none, but such as He had He gave to men, the gentle touch of a sympathetic hand, the golden glow of a genial mind, the healing love of a generous heart, the bracing energy of a courageous spirit.

"It is when we give of the things of the spirit that we escape from the realm of embarrassments and burdens. Into a spiritualized Christmas we everyone can enter, the rich and the poor, the high and the low, the small and the great.

"In preparing, then, our Christmas presents, let us get ready to give some of the things which Jesus gave. Along with the many gifts which have prices, let us give a few which are priceless. Let us give thought to someone who needs it, sympathy to someone who craves it, praise to someone who deserves it but does not get it, kindness to someone whom the world has overlooked, affection to someone who is starving for it, inspiration to someone who is fainting because of the lack of it. One's Christmas does not consist in the abundance of the things which he receives or gives away, but in the spirit of good will which fills his heart."

Report on Boonville Schools.

Editor DENTAL SUMMARY: I herewith hand you report of dental inspection in Boonville schools. This report represents about half of the grade pupils. We have been working for a couple of years to get into the schools here, and finally, by using newspaper talks and other articles on the need of this work, we have made a complete examination of the eight grades, with the following result:

Grade	No. Ex.	Tooth Brush	No Tooth Brush	Family Tooth Brush	No. of Cavities	Perfect Mouths	Abscess	Had Work Done	No Work Done
1st	78	21	51	9	345	14	1	6	72
2nd	36	14	22	3	152	4	0	4	32
3rd	38	13	25	2	149	5	1	4	32
4th	104	51	53	0	338	17	3	20	84
5th	38	22	16	2	88	8	0	6	32
6th	32	22	10	0	68	9	1	11	21
7th,8th	38	31	7	0	81	9	0	14	24

Condition found in our schools not nearly so bad as some reports. I have read in journals of other schools.

F. W. TRAYLOR,
Boonville, Ind.

Copper as a Preservative

Copper is recognized as a germicide and its presence in a tooth practically inhibits the growth of bacteria, thus exercising a therapeutical value, arresting decay and acting as a sedative in sensitive teeth.

Some have expressed the fear that copper oxide might contain arsenic oxide, but there is good authority for the statement that the production of arsenic, free copper oxide and cobalt oxide was solved long before these oxides were used in cement manufacture.—By E. P. Dameron, D.D.S., in *The Dental Brief*.

On Worrying

Worry is a disease. In fact, it is ofttimes associated with a physical disorder of some kind. The inclination to worry over trifles is universal. Some people have acquired the worry habit. It sticks to them like an adhesive plaster. Their first mental effort on rising each day is to seek out some unpleasant subject to worry about. One can readily imagine the disappointment that would ensue should a person of this character find nothing to worry about. But this would be an unusual sensation, for one can always find something to worry about. If not a misfortune of yesterday, then one of the day before—if not of this year, then of last year. If you are a victim of the worry habit, you are uselessly wasting valuable energies. Rest assured that life will be of little value to you or to anyone else.

Physical exercise is of invaluable assistance in this respect. When you find, for instance, that you cannot possibly avoid worrying, then immediately find some means of actively using the muscles of your body. Take a long walk, or play some game in the open air that will keep you continuously and pleasantly occupied. If this is difficult or impossible, take some exercise in your room. Work persistently and vigorously until the blood is bounding through your arteries, until you feel the pulsation of new life stirring your entire physical organism. Realize the tremendous possibilities in life and stop wasting your time with trifling grievances. You must remember that worries are never important, notwithstanding the value they may seem to assume in your life. Their only importance is the power they have for harm, and if their power is evil, then by all means they should be recognized as evil, and every effort should be made to stamp them out of your life. You can rest assured that the exercises taken as a worry cure will accomplish the desired purpose if they are given your entire attention, and use all the muscles of your body and vigorously arouse the activity of your lungs and heart.—From *Physical Culture.*

Dentists inspect all Schools

If Health Commissioner Fronczak's plan is adopted children in the Buffalo N. Y., schools, public, parochial and private, will have their teeth examined every month by a dentist in the employ of the city.

Dr. Fronczak says that the plan can be put into operation at very little expense. He would have a dentist added to the force of medical school examiners. At present there are five physicians acting as school inspectors, with about 25 assistants.

"It would be possible," says Dr. Fronczak, "for one dentist to visit about three schools a day and besides he could give helpful lectures, showing the children how to take care of the teeth. New York, Philadelphia, Chicago, Rochester and other cities have adopted this plan."

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If your subscription expires with this month, send in your renewal at once. We are sure that you do not want to miss a single issue, and are doubly sure that you cannot afford to do so.

The constant improvement in THE SUMMARY will be consistently continued. Our plans contemplate going straight ahead until THE DENTAL SUMMARY shall be recognized everywhere as the one professional journal that no dentist can afford to be without.

A double end tooth brush, especially designed to reach the inner surfaces of the teeth, has been invented by a dentist of Memphis, Tenn.

Idiotic Inquiries

(Addressed to the propounder of the question: "How much wood would a woodchuck chuck if a woodchuck would chuck wood?)

How much good could a hoodoo do
If 't were hoodoos who do good?

What size shoes do Jew crews choose
When Jew crews go on cruises?

Bill with a bill-file filing bills—
Bill may file for a long, long while,
But who can guess at the size of the pile
Bill with his bill-file
Will file?

If a hobo's hose have holes in the toes,
And the hobo's nose is the color of a rose,
And the hobo hoes where the goober grows,
Why do you s'pose that nobody knows
How many rows the hobo hoes?

—*Lippincott's.*

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AN ERROR CORRECTED

By an unfortunate accident an error occurred in the advertisement of the Buffalo Dental Mfg. Co. in our November number, by which the price of Bracket for Lewis Illuminator appears as $3.00 instead of $3.70 as it should have been.

Classified

Advertisements under this heading, $2.00 each for 60 words or less; additional space 2 cents per word, single insertion three insertions or more, special rate on application.

WANTED—DENTAL PRACTICES:—BIG LIST OF BUYERS—A time-tried system that gets the buyers without publicity to the seller. Write for information. Dentists looking for locations write for our FREE Bargain sale lists. Mention states desired. "The Dentists' Middlemen," A. E. Hoag, D. S. S., Manager, Central Office, Carrollton, Ills. C. M. Cryor, D. D. S., Manager Western office, Old National Bank building, Dpokane, Wash. 1120-3

FOR SALE—Old well-established cash practice of $5000 in rich county-seat of 14,000; population of county, 40,000. Office well equipped, and furnished up to date. Prices good. Practice can be doubled by advertising. Address: 1210, The Dental Summary.

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FOR SALE—Practice of $2500 per year in town of 4000 population. Good location; good equipment, latest pattern Columbia engine, Ritter motor, etc. Will also consider conducting the practice on percentage basis. Address; J. H. G., 1200, care The Ransom & Randolph Co., Cleveland, Ohio.

FOR SALE—A completely equipped office—two chairs, fountain cuspidors, cabinet, engine, furniture, fixtures and stock, ready to step into and go to work, for $400 on time payments, or liberal discount for cash. Address: W. S. Milligan, D. D.S., 409 Genessee Ave., Saginaw, Mich. 1220

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FOR SALE—Offices in two towns in southern Michigan at a bargain. Population 1000 and 700 respectively. Towns short distance apart. No competion. Towns handily reached. Must sell QUICK. Will sell one or both outfits. Address: X1250, The Dental Summary.